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ABSTRACT

A questionnaire sent to 274 Michigan special education teachers in resource rooms and self-contained classrooms were dsigned to identify the treatment methods and materials used by these teachers to teach penmanship and spelling to learning-disabled students. A review of the literature examines the theoretical background of written expression, practices being used to teach penmanship and spelling, problems of the learning disabled, and remediation methods and materials used with the learning disabled. (Of the survey recipients, 92 sent useable replies for a response rate of 34%). Results indicated that teacher-preferred methods for penmanship were tracing, use of the D'Nealian manuscript and cursive styles, and air writing. The preferred materials included ditto sheets for writing, finger grip pencils, changeable plastic grips for pencils, color coded paper, and colored chalk. Teacher-preferred methods for spelling instruction were language experience and individual spelling, peer tutoring, and visual-auditory-kinesthetic-tactile techniques. Teacher-preferred materials included workbooks, spelling lists, and computer games. Appendices describe the D'Nealian pencil grip, outline the reading and spelling patterns of children with learning disabilities, and provide a copy of the survey form. (76 references) (JDD)

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Teacher-Recommended Methods and Materials for Teaching Penmanship and Spelling to the Learning Disabled

By

Regina A. Stein

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Submitted to
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COMPLETION OF A MASTER OF ARTS IN TEACHING PROJECT

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ABSTRACT

Teacher-Recommended Methods and Materials

for Teaching Penmanship and Spelling to the Learning Disabled

Regina A. Stein

The learning disabled frequently have deficits in the basic writing skills of penmanship and spelling. The question of this study was "What treatment methods and materials are special education teachers using to teach penmanship and spelling to the learning disabled?" In an attempt to answer this question, a survey was sent to 274 Michigan special education teachers in resource rooms and self-contained classrooms. This study explores the following areas: the theoretical background of written expression; the practices curently being used to teach penmanship and spelling; the problems of the learning disabled; and the remediation methods and materials used with the learning disabled. The teacher preferred methods for penmanship included: Tracing, D'Nealian manuscript and cursive, and Air writing. The preferred materials included: Ditto sheets for writing, Finger-grip pencils, Changeable plastic grips for pencils, Color-coded paper, and Colored chalk. Teacher-preferred methods for spelling included: Language Experience and Individual spelling, Other (miscellaneous assortment), Peer tutoring, and Visual-Auditory-Kinesthetic-Tactile (VAKT). Teacher-preferred materials included Workbooks, Spelling lists and Computer games.

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CHAPTER ONE

INTRODUCTION

Learning disabled students frequently have deficits in the basic writing skills of penmanship and spelling. These skills are necessary for success in higher levels of written language. The question of this study was "What treatment methods and materials are special education teachers using to teach penmanship and spelling to the learning disabled?" In an attempt to answer this question, a survey was sent to 274 teachers in resource rooms and self-contained classrooms in the state of Michigan.

This chapter will give definitions of terms and some theoretical background for thinking about the place of penmanship and spelling in language development.

Definitions

Learning Disability, as defined in this study, is the Michigan definition of learning disabilities:

> "Specific learning disability" means a disorder in 1 or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance, of autism, or of environmental, cultural, or economic disadvantage (Michigan Board of Education, 1986, pp. 10-11).

For the purposes of this paper, learning disabilities were limited to deficits in penmanship and spelling. The abbreviation LD refers to the learning disabled.

Penmanship is the act of writing with a pen or pencil.

Spelling is the writing of letters of a word in order or the manner of writing or expressing words with letters or orthography (World Book Dictionary, p. 2000).

Phonemes are the smallest units of sound that go into forming words.

Grapheme is the symbol that represents the speech sound.

Morpheme is the smallest meaningful unit in words.

Syntax refers to sentence structure.

Semantics refers to the meaning of words and word relationships.

Written expression according to Myklebust (1960) is the highest level language accomplishment. "It requires translating language comprehension, reasoning and expression skills into a visual symbol system used for reading (spelling), and then expressing the product through fine motor movements (penmanship). It involves the coordination of auditory, visual, motor and cognitive abilities (Smith, 1983, p. 250).

Theoretical Background

It is important to understand the relationship of penmanship and spelling to language. In this section, the work of Luria (1966), Johnson and Myklebust (1967), and Kass (1986) will be briefly described in relation to the development of spelling and penmanship.

Luria

Luria (1966) suggests that language can be divided into spoken and written speech. Spoken speech or oral language is formed in the early stages of a child's development as a part of direct contact with other people. Spoken speech is made up of sounds or phonemes. These phonemes are strung together to form words. Meanings are attached to words. Spoken speech usually "develops 'automatically' and without conscious analysis of its phonetic composition" (p. 408).

Through the alphabetic system, phonemic and graphemic elements become fused into words to produce written speech. In school, the child is taught to associate the spoken

speech with the written speech for reading and spelling. In order to read, the child must not only be able to see, and perceive the whole graphic representation, but, more importantly, he/she must be able to hear and understand the sound-symbol correspondence. This involves analysis and synthesis of letters into words until the process becomes automatic. Written speech does not develop automatically, but "is a voluntary, organized activity with conscious analysis of its constituent sounds" (Luria, p. 408). According to Luria (1966), the writing process is complex and systematic, but occurs in stages of development. The following paragraphs explain the process of writing in Luria's own words:

> In the great majority of languages, both writing from dictation and spontaneous writing begin with the analysis of the phonetic complex that goes to form the pronounced word. This phonetic complex can be broken up into component parts, and the fundamental units composing the word-the phonemes-can be distinguished within the smooth sequence of sounds. Under acoustically simple conditions, the discrimination of phonemes is not a particularly complex process. Under acoustically complicated condition-including unstressed vowels, consonants modified acoustically because of their position, and elision of consonants-this process is transformed into a complex activity, involving the isolation of sounds from irrelevant acoustic signs and the recognition of stable phonetic units. The phonemes identified as a result of such activity must be arranged in a certain order and recoded into the corresponding optic structures-graphemes-possessing their own visual-spatial properties; in the final stage, the graphemes must again be recoded into a system of motor acts. This complex process is undertaken by means of a complex mechanism, the various components of which stand out clearly in the initial stages of the formation of the writing skill, when writing is still deliberate and extended and has not yet become automatized. It is only later that this process becomes

condensed and acquires the character of the highly automatized skill easily observed in adult's writing.

Analysis of the phonetic composition of speech, the starting point of any form of writing, naturally requires adequate preservation of phonetic hearing. However, investigations on the initial stages of the writing skill have shown that articulation plays an essential role in the task of precise definition of the phonetic composition of words; in an elementary, expanded form, articulation is used by children during the first years of their learning to write. At that stage, it consists of speaking the words aloud, which is the motor component of their phonetic analysis. Observations on the writing of individuals who are deaf or with articulatory disturbances (Boskis and Levina, 1936; Boskis, 1953; Levina, 1940; etc.) have shown that both a disturbance of hearing and a disturbance of articulation may severely impair the differentiation of the required phonemes, a fundamental constituent of writing. Similar difficulties in phonetic analysis and, consequently, in the process of writing in the initial stages of education of the normal child may be brought about by blocking the articulatory components; this can be accomplished by instructing the child, for example, to write with the mouth open. The special investigation conducted by Nazarova (1952) showed that the number of mistakes during writing is increased manyfold when this is done.

In writing it is important to preserve the correct sound sequence; this demands analysis of the consecutive sound series in every word and inhibition of the strong components of this series if they are not in crucial positions. The complexity of this neurodynamic process has been sufficiently illuminated by the numerous investigations dealing with the process of elaborating the corresponding differentiation. Observation has shown that this process is

easily disturbed by any diminution of active inhibition (Pevzner,1960).

The second stage in writing, no less complex in nature, is concerned with the recoding of the identified phonetic elements (phonemes) into optic elements (graphemes) and with rendering them in writing. Every grapheme has its own particular visual-spatial structure, whose realization requires complex spatial analysis. The difficulties in understanding graphemes that arise with weakened visual differentiation, especially if associated with defective spatial analysis (associated with impairment in the right-left distinction), are generally appreciated. The phenomenon of mirror image writing, more commonly found when lateralization is inadequate (for example, before the dominant role of the right hand has been established and in left-handedness), is familiar to all. Investigations have revealed the complex path the motor organization of writing travels in the successive educative stages. Gur'vanov (1940) and Pantina (1954) have shown that when one is beginning to acquire writing skill every graphic element requires a special impulse that in the subsequent stages generalization of the elements of the skilled movement with their combination into a single kinetic melody occurs by degree; eventually the object of conscious performance is no longer the separate strokes of each letter, but the writing of the whole word or sometimes even of a whole short phrase (pp. 408-410).

What we are exploring in this study are the lower levels of writing in young children (grades one through six). In Luria's terms, the early stages of writing development require articulation, and visual spatial analysis for the graphemes. Both sensory analysis and integration of the processes are necessary for writing. A disturbance in one or both of the processes in a child will adversely affect development.

Johnson and Myklebust

Johnson and Myklebust (1967) advanced a theory of information processing which stresses that the brain includes three main components; input and output systems, sensory modalities (visual, motor, auditory, and vocal) and the integration of these systems and modalities. Some tasks require the integration of more than one system. Spelling and penmanship involve both the visual, auditory and motor systems.

This hierarchy of normal development of language systems places writing or visual expressive language at the highest level of attainment. The hierarchy begins with "inner language," which is followed by "auditory receptive language (hearing)," "auditory expressive language (speaking," "visual receptive language (reading)," and "visual expressive language (writing)." According to this theory, input precedes output. The child receives information first; then comprehends or understands language before speaking, reading, and writing.

The hierarchy provides the basis for explaining the difficulties of learning disabled children. Visual Expressive Language is the fifth and highest level of development. As with each of the lower levels, there are individual components of each stage. Using the hierarchy, an impairment at any of the lower levels of development affects all others. Thus, spelling and penmanship skills lead to the highest level of writing.

For the purposes of this paper, the two lower level components of writing will be discussed--penmanship and spelling. The later stages, while important, will not be addressed in this paper due to the intent and focus of this study.

Kass

Kass (1986) explains learning deficits in terms of a developmental stage theory with a critical age feature.

Developmental stages refer to periods of time when certain characteristics appear in the human being; the critical-age feature means that certain

learnings must occur within the particular stage when certain characteristics are meant to develop. If learning does not occur during critical stages, future learning is negatively affected (p. 9).

In the learning disabled, the critical age-related deficits affect the acquisition of penmanship and spelling. The Kass (1986) definition of learning disability is the following:

> Learning disability (dyssymbolia) is characterized by extreme deviance in the acquisition and use of symbols in reading, writing, computing, listening, or talking; which deviance is due to an interaction between significant defects in developmental functions and environmental conditions which make the individual vulnerable to those dysfunctions. If the extreme deviance in dealing with symbols is noted within a critical age range, corrective developmental instructional treatment should be sufficient, but if such deviance is not corrected within a critical age range, specialized treatment methods are required (p. 7).

As noted in this definition, the learning disabled have extreme difficulty learning symbols, letters in the case of spelling and penmanship. A feature of the Kass definition is the importance of remediation during the critical periods. Spelling and penmanship are basic skills in which the learning of letters and movements must be accomplished by ages 11-12, or remediation is difficult.

A brief outline of the Kass set of critical characteristics of the learning disabled is given below (Kass, 1986):

Remediation for Age-Related Characteristics of the Learning Disabled

Sensory Orientation (birth to 18 months)

During this stage, the child deals with the environment on a sensory-motor basis. Looking, listening, touching, and doing are important learning tasks. The learning disabled may have difficulty following stimuli with their

eyes (Visual Pursuit) or reacting to sound stimuli (Auditory Discrimination):

1. Visual Pursuit. Remediation should be initiated immediately when an infant does not visually study objects and persons. While all infants should be physically held to establish human bonding, the learning disabled may resist being cuddled. These infants must be held in spite of resistance and must be talked to with the adult's face only about six inches away from the infant's face. A finger, ball or flashlight may be presented to the child to look at and then moved while the child is watching.
2. Auditory Discrimination. Remediation should focus on meaningful sounds, mainly speech. Make noises at various distances from the infant which call for reactions such as looking, smiling, sudden turning of the head, or verbal reactions. Use the infant's name often to capture the attention. Give the child time to respond to sounds. The children usually do not respond while the adult is making sounds but will respond later after appearing to be practicing internally. Any sounds produced by the infant should be imitated by the adult, and should be expanded into words. Repeat simple directions, such as "come here," "take it," "eat it," and "say ball," again and again until the infant uses verbal directions for self-instruction. A proper foundation in auditory discrimination leads to later phonic skills.

Memory (18 months to seven years)

During this stage, the child is able to reproduce sensory impressions when the stimuli which initially aroused the senses are no longer externally present. Mnemonic aids are not necessary during this stage. The normal child memorizes easily; but the learning disabled child has difficulty

memorizing due to deficits in controlling his or her reactions to stimuli, both external and internal (Hyperexcitability), and in the ability to practice input for later recall (Rehearsal):

1. Hyperexcitability. Remediation requires competing with the internal "noise" within the child. Whatever we wish the child to learn must be of sufficient intensity to capture his or her attention. In the past, all extraneous stimulation was typically taken away (Strauss and Lehtinen, 1947; Cruickshank, 1967). Teachers were not to wear colorful clothes or jewelry, there were to be no pictures on the walls, and children were placed in cubby-holes with only the immediate task before them. This treatment is still used with adaptations, but more recently the treatment of choice is the use of drugs. Providing close, loving, personal experiences with the teacher (or parent) may be just as successful as decreasing stimulation or using drugs. Much repetition and verbal reassurance about experiences are needed because the learning disabled child frequently does not focus long enough for stimulation from the outside to enter through the senses in order to be recalled later. An adult should almost always be with the preschool age child who is hyperexcitable. This adult should be constantly pointing, labeling, and explaining. Repetition is extremely important. The school-aged child who is hyperexcitable must be monitored closely. Learning to follow directions is critical for successful school learning. The special teacher, by teaching the child how to pay attention, will make it possible for the child to conform to expected behavior in the regular classroom.

2. Rehearsal. Remediation should provide opportunities for verbal practice of information which must be overlearned. When children with learning disability desperately desire to engage in some motor activity (say, bicycle riding), they practice that activity repeatedly. In the special classroom, the teacher will give instructions over and over, and the child will be asked to repeat instructions over and over, and the child will be asked to repeat instructions aloud until a connection is made between the instruction and the action. The learning disabled may not be able to learn sentence patterns unless they are given short sentences to imitate. They should practice labeling objects, pictures, letters, and numerals constantly. In addition, they must overlearn words, phrases, sentences, and simple arithmetic facts through repetition and drill. The special teacher will attempt to connect a stimulus with an internal response and will not allow passive imitation. The special teacher will know when rote imitation becomes internalized. Imaginative play following much repetition will show that the rehearsal deficit has been corrected.

Re-Cognition (seven to 11 years).

During this stage, the child begins to understand sensory impressions which have been overlearned. The learning disabled may show deficits in the internal representation of overlearned symbol sequences or experiences (Visualization), in noting differences with muscle sensations (Kinesthetic Discrimination), in noting differences in the sense of touch (Tactile Discrimination), or in being able to analyze context into important and unimportant parts (Figure-Ground Discrimination):

1. Visualization. Remediation requires a careful distinction between

understanding the context and accurately perceiving the parts contained within the context. The special teacher will help the child look at all the parts of objects, words, and problems. The child must be able to "see" in his or her mind's eye. When it is necessary for determining meaning, the child must be able to return to accurate examination of language symbols.

2. Kinesthetic Discrimination. Remediation requires making the child aware of arm muscle movements in writing and spelling, and eye muscle movements in reading. The Fernald method (Fernald, 1943) which calls for imitating the stimulus from memory through writing (muscle memory), is probably the most widely used method by special teachers for teaching children to write, spell, remember words in reading, and remember simple arithmetic facts. This method includes having the child look at a word or phrase, attempt to take a picture of it in his or her mind without saying the letters and then attempt to write it from memory. It is important that the child pay attention to the muscle sensation while writing the word.
3. Tactile Discrimination. Remediation for this deficit focuses on teaching the child to hold a writing utensil properly, not so tightly as the learning disabled often do. The special teacher helps the child write letters and numbers correctly in a flowing manner, rather than allowing the child to "draw" these symbols. Penmanship may be taught through the D'Nealian alphabet (Scott, Foresman and Co.) which transfers readily from printing to cursive.
4. Figure-Ground Discrimination. Remediation must correct the distractibility of the learning disabled who seem to have difficulty

focusing on important features of the task. The special teacher will constantly verbalize what the child should be doing while he or she is doing it, to close out interfering stimuli. The child should learn to do this verbalizing for himself or herself as soon as possible. Pointing helps as does naming letters or numerals in connected material. It is necessary not only to have eye-hand coordination, but also to have eye-voice coordination means that the eye is exactly on the letters of a word as these are being pronounced.

Synthesis (11 to 14 years)

By this stage, the acts of reading, writing, arithmetic, and spelling are fairly automatic. Physiologically, the senses have become integrated. The system needs only to react when errors occur; that is, when the senses note that something is wrong. The learning disabled may show deficits in noting and correcting errors when these occur (monitoring), in organizing oneself in time (Temporal Orientation), and in automatically associating information from two or more senses (Sensory Integration):

1. Monitoring. In remediation, it is necessary to undo bad habits which the child has acquired earlier. How are habits undone? Habits can be extinguished only when the person becomes aware of the habit and then consciously analyzes what is wrong. The focus of remediation is on errors--the special teacher must detect errors, tell the child what these are, and then provide the correct response until it is overlearned.
2. Temporal Orientation. Remediation by the special teacher will be geared toward teaching the student how to deal with time. This includes study skills, understanding of time, and organization of time.

Related to this deficit is the need for remedial teaching in the completion of tasks and handing in assignments.

3. Sensory Integration. One of the best activities for forcing all of the senses to work together is writing as the special teacher dictates. Sounds must be blended into wholes, production of symbols must be in correct sequences, and movement must be fluid. As the student writes from dictation, the special teacher will be watching for sensory integration. When the student pauses in writing, when the letters or numbers are reversed or when any other mistake is made, the special teacher will stop the student, will model the whole, and ask the student to start again from the beginning of the task. By beginning again each time a hesitation or mistake occurs, the student learns how to produce a coordinated whole. The material for dictation will come from the student's regular textbooks, if feasible.

Communication (14 years and up)

This is the process by which learned concepts and automatized modes of response are used in the service of receiving ideas from others and expressing ideas to others, both consciously and unconsciously. The learning disabled have difficulty comprehending what they read (Reading Comprehension, solving mathematical story problems (Mathematical Comprehension), and expressing themselves in writing (Writing):

1. Reading Comprehension. Having typically experienced failure in acquiring the skill of reading, the learning disabled have had relatively little practice in the wide spectrum of reading experiences. The special teacher will often start with modeling reading with comprehension. The best means for doing this is through choral

reading (with exaggerated pronunciation). As the student reads along with the teacher, the teacher will be listening for types of mistakes, for phrasing, and for the kind of reading that connotes understanding. Select textbooks and reading materials appropriate to the student's chronological age interests for use in remediation. When programmed or workbook exercises are used, check constantly for transfer of the acquired skills to the student's regular classroom textbook materials.

2. Mathematical Comprehension. The basic skills to be taught are the ability to hold directions in mind and the ability to visualize the operation. Remediation must teach the "idea" of mathematics. A ritualistic dependence on each step in a sequence of solving a problem is necessary for the sequence to become automatic. Verbalizing by the special teacher and the student helps to imprint the sequence. Special attention is given to the hierarchial nature of mathematics and the importance of building on a solid foundation in operations prerequisite to other operations.

3. Writing. The learning disabled often have difficulty in spelling, in syntax and in penmanship. They shun writing, which makes the problems worse. Remediation will include copying stories, writing experience stories or compositions, and rewriting. If penmanship is a problem, give lessons in cursive writing before asking the student to write extemporaneously. Cursive writing is important for acquiring smoothness in writing. If spelling is a problem, the special teacher will use a modified Fernald method as described under Re-Cognition. If grammatic usage is the problem, a textbook on grammar might be used with the teacher presenting the material step-by-step. Constant

and consistent correction while the student is writing is important in the early stages of remediation. Verbalizing what is being written is always helpful in remedial teaching (pp. 36-37).

CHAPTER TWO

REVIEW OF THE LITERATURE

Luria says that language can be divided into spoken speech and written speech. Johnson and Myklebust say language can be divided into receptive and expressive processes and that input precedes output. Kass says that learning must occur during critical ages. They all believe that the skill components in language are integrated and occur in stages of development.

The focus of this study is on penmanship and spelling which are components of written speech. Both are output processes which are on lower levels in the hierarchial order of skill acquisition in written expression.

Penmanship

Penmanship is the act of writing with a pen or pencil. It is a necessary skill for written communication from first grade through adulthood. Even today with the modern technology of self-correcting typewriters and word processors, it remains an essential skill, and competency is expected.

Poteet (1980) constructed this hierarchy of written expression: Penmanship, Spelling, Grammar, and Ideation. Poteet suggests this as a basis for assessment and remediation. Penmanship is first because it must be legible before the other components can be developed. According to Poteet (1980, p. 89), penmanship includes not only the actual letters, but also the "spacing of the writing on the total page, the spacing of sentences, words, and letters, slant, letter formations, pressure on the paper and pencil grip."

Acquisition.

In discussing the acquisition of penmanship skills, what can be expected developmentally of children entering first grade? Luria (1973) writes that an important stage in writing is concerned with the recoding of phonemes into graphemes and rendering

them in writing. This depends on visually remembering the graphic forms of each letter. The second part of the process involves individual motor movements which combine into a chain of movements. Through practice the process is changed into a single "kinetic melody" (p. 32).

Freeman (in Smith, 1983) identifies typical penmanship acquisition in the following way:

> By the time children enter first grade they can typically hold a pencil in a loose, comfortable three-finger grasp, print the letters of the alphabet from memory, and copy words containing three or four letters from the board on paper. They know that printing proceeds from left to right and they can stay reasonably close to the line. Their letters may vary in size, spacing, alignment, proportion, pencil pressure (heavy, light), slant, and form (vertical, horizontal, diagonal, and circular strokes) (p. 234).

Children entering school today are probably taught one of two manuscript methods currently used throughout the nation: Circle and Stick, and D'Neallan. Circle or Ball and Stick manuscript was devised by Margaret Wise in 1924 (Phelps and Stempel, 1987). Barbe (1983) suggests that Ball and Stick manuscript is the most legible style of writing. He supports this by examples of world-wide use, from advertising to road signs. The importance of legible printing is a priority for younger children who "are expected to read what they have written" (p. 399). Barbe also believes that developmentally Ball and Stick manuscript is more consistent with perceptual and motor development of young children than cursive writing.

Zaner-Bloser has been producing penmanship materials since 1888. Zaner-Bloser (1989) uses Circle and Stick and offers two classroom methods: Traditional and Continuous Stroke, which was introduced in 1989. Both methods are based on six basic strokes: horizontal, vertical, backward circle, forward circle, slant right and slant left. Traditional

Circle and Stick contains separate strokes in which the child must pick up the pencil. For example, the letter "b," would involve a vertical stroke and a forward circle. Using the Continuous Stroke approach, the child would not pick up the pencil when going from the vertical stroke to a forward circle. Zaner-Bloser teaches pencil position for both right and left handed students. It also teaches paper position, and pencil grasp. Letters are introduced by letter families.

The Zaner-Bloser approach uses a special writing paper with red and blue lines. Red lines indicate where to start a letter, dark blue lines where to stop, a light blue line where to cross a "t". The red baseline paper varies in width from one and one-half inches for kindergarten to three-fourths and one-half inches in second and third grades. The differences in width may accommodate the transition of visual-motor development in children. The kind of paper used by children when practicing penmanship skills is an issue between the Zaner-Bloser and D'Nealian methods. The use of different widths of paper has been based on beliefs rather than research. According to Halpin and Halpin (1976), only one prior investigation studied the effects of different kinds of paper, and that was in 1943. The study conducted by Halpin & Halpin (1976) included 44 children in three kindergarten classes with a median age of five years-ten months. Fifteen lesson plans were developed to give the students practice in using different kinds of paper. The lessons consisted of strokes, words, and sentences which the students copied from a model on their papers. After the experimental lessons were completed two different handwriting samples were obtained from each student, including a sentence, and a group of letters which the students copied five times. The samples were then analyzed according to the following criteria: uniformity of slant, uniformity of alignment, quality of line or stroke, letter formation, and spacing between letters and words. The study concluded "that the width of the writing space (one inch or one-half inch) had no differential effect on the quality of beginning handwriting" (p. 269).

The D'Nealian system of handwriting was devised and published by Donald Neal Thurber in 1968. D'Nealian is a simplified form of manuscript which emphasizes, half -inch size letters, a continuous stroke and a fixed slant in any direction. The letter shapes are based on past handwriting models including italic. Some letters are oval-shaped instead of circular as in traditional manuscript. Several basic strokes are used in D'Nealian. The letters a, d, h, l, m, n, t, and u, have "monkey tails" which are connectors for later cursive writing. The letters g, h, g, and y are "fish hook" letters. The spacing of the letters are half line, full line, and half-line below the base line. The D'Nealian system uses directions such as "high start" for letters b, h, k, l, and t. The directions follow the continuous stroke and and when learned by the child, become self-verbalizations and a strategy for learning. The directions for the letter b are as follow: "Start at the top line; slant down to the bottom line; go right around, up to the middle line; curve left and close" (Scott, Foresman, 1987a. p. 18). Once learned the shortened form becomes, "High start, down, around, up into a tummy." (Thurber,1984, p. 47). The letters are introduced by letter families.

The D'Nealian method does not require oversize primary pencils or large-line paper. Teachers may use lined or unlined paper for instruction. Students are directed where to start using the lines and spaces. Scott, Foresman now produces D'Nealian materials with letters about an inch high for kindergarten students. The D'Nealian method provides for individual differences because it doesn't insist on someone else's slant. Legibility is most important, so vertical, right or left slant is acceptable.

A criticism of D'Nealian has been that too little attention was paid to writing position, arm and hand movement, and pencil grasp. D'Nealian now suggests a pencil-grasp between the index and third fingers and resting on the third finger (Appendix A). The system also suggests a writing position and includes photo samples in student texts. The D'Nealian grip may be beneficial for students or adults with problems holding a pencil or pen. According to Thurber (1990) the D'Nealian grip benefits people with Down's

Syndrome who have difficulty using the index finger to grasp objects.

In the hierarchy of penmanship, cursive writing is usually taught to children after manuscript printing. Cursive letters are connected letters and there are several styles: Palmer, D'Nealian, Zaner-Bloser and Hanover. The Palmer method, published by A.N. Palmer Co. (1901), involves whole arm movement, and practicing ovals and push-pulls to develop pre-writing skills (Phelps and Stemmpel, 1987). The Palmer method was popular from the beginning to the middle of the century. It was based on the Roundhand style of cursive without the sweeping strokes or shading of that method (Scott, Foresman, 1987b).

Getman (1983) describes the Palmer method in detail and discusses the advantages:

> Research now shows that the most productive arm and hand movements, producing the least physiological and cognitive stress, have to come off the ball and socket joint of the shoulder with the full arm involved in the movements required for the final formation of all letters. The "inherent factors" [of the Palmer method] contribute to the completion of the motor patterns that eventually allow handwriting to become such a habitual skill, the mind is free to think while the arm and hand automatically produce the words the mind chooses (p. 141).

Zaner-Bloser has been producing penmanship materials for more than one hundred years. The Zaner-Bloser letters appear to be based on past handwriting styles including the Roundhand style. Zaner-Bloser teaches four basic strokes in cursive writing: slant, undercurve, downcurve, and overcurve. The letters are grouped and taught by the strokes which are used to write them. The red baseline paper is used and widths of spaces vary from one-half to three-eighths of an inch.

The D'Nealian is the cursive form of the printed manuscript and a natural extension of that letter formation system. According to Connell (1983), D'Nealian is based on eighth

century chancery cursive. The method stresses a consistent slant in any direction and the use of small oval shaped letters not over 1/2 inch high for capitals. The letters are shaped almost identically to the printed D'Nealian which is a strength of the method. D'Nealian printed and cursive forms have self-verbalization directions which are taught to and practiced by the students using this method. Thurber (1983) says the method becomes multi-sensory as the auditory-visual flows into the kinesthetic-tactile performance of writing.

Today, a debate exists over which printing method to teach before teaching cursive: Circle and Stick manuscript or D'Nealian. A study conducted by Trap-Porter et al. (1984) tested the claim of Scott, Foresman & Company that the D'Nealian manuscript alphabet facilitates the transition between manuscript and cursive writing. The study was conducted on a total of 112 students in eleven first grade classes in six schools in central Ohio. The students had received no prior cursive instruction, and previous training had been in D'Nealian manuscript or Zaner-Bloser manuscript. The Zaner-Bloser Creative Growth Transitional Cursive Alphabet was used in the study. Trap-Porter et al. decided that since there were no major differences between the Zaner-Bloser and D'Nealian cursive alphabets, the same model sheet could be used with all students in the study. The paper was wide spaced transition paper with seven-sixteenths of an inch spaces between the blue headline and midline, and red baseline. Students were instructed in the continuous stroke, slant, and the purpose of the red line. They were instructed to figure out each letter but were shown the Zaner-Bloser models. No feedback was given to students on the quality or correctness of the writing samples. The total session lasted between 20 and 30 minutes. The number of correct strokes made by each of the students was analyzed, and negligible differences were found between the two groups.

For the group receiving training with Zaner-Bloser materials the average percentage of correct cursive strokes was 73.49% for males and 72.86% for

females. The male and female students in the D'Nealian group averaged 72.81% and 72.40% correct cursive strokes, respectively (Trap-Porter et al., 1984, p. 344).

Trap-Porter suggests that a limitation of the study may have been the use of wide-spaced paper, and that may have affected the performance of the D'Nealian group. Thurber (1990) suggests that another limitation was the use of a overlays to measure the deviation of student letter samples from model letters. The D'Nealian system emphasizes legibility.

In a study conducted by Ourada (1985), the subject was the "Legibility of Third Grade Handwriting: D'Nealian Versus Traditional Zaner-Bloser." In addition to legibility, slant, letter form, and letter size were also evaluated. Forty-four third graders who had been taught circle and stick manuscript, but no cursive were included in the study. Four twenty-minute penmanship lessons were taught each week for twelve weeks. In the Zaner-Bloser group, the class reviewed manuscript printing for four weeks before beginning cursive. In the D'Nealian group, the students relearned manuscript in the continuous D'Nealian stroke for four weeks before beginning the D'Nealian lower-case cursive. The paper used was third grade 3/8 inch lined paper. The cursive samples at the end of the study were evaluated by 10 judges. The results of the study are as follow:

	Legible	Not Legible
Zaner-Bloser	75%	25%
D'Nealian	86%	14%

The same study found the D'Nealian letter formation 29% more acceptable than the Zaner-Bloser letter formation; the D'Nealian letter slant 12% more acceptable, and letter size 9% more acceptable than those of students using Zaner-Bloser.

In addition to the question of which manuscript method is best, Circle and Stick or D'Nealian, some ask in which grade should cursive instruction begin? Barbe and Johnson (1984) suggest that students need ample opportunity to use manuscript to write and

communicate before making the transition to cursive. They suggest the beginning of third grade based on a study conducted by Milone & Wasylyk (1980) who found that the children introduced to cursive writing in third grade received higher scores than those of second graders when samples of students' writing were rated. Although the results of the pre and post testing did not show a significant difference between the second and third graders, they were consistently in favor of the third graders.

There are other publishers and methods of teaching penmanship. Many combine the use of script and cursive in letter formation. The Hanover method is one version of cursive. Developed by Stella Hanover (1983), it "is based on a single principle of the grouping of letters into families" (Hanover, p. 408).

The families include: "e" family (e, l, h, f, b, k); the "c" family (c, a, d, o, q, g); the "hump" family (n, m, v, y, x); the letters with tails tied in back, (f-q); the letters with tails tied in front (g, p, y,z); and the r and s. Also included in the lessons are the letters with a handle (b, o, v, w) (Hanover, p. 409).

Problems in the Learning Disabled

Many learning disabled students have problems in the acquisition of written language (Johnson and Blalock, 1987). Some may have poor letter formation and spacing. Writing is often illegible and painstakingly slow. Students may often have tight grips on the pencil, and they may have the wrong posture for writing. Some learning disabled students may lack the pre-writing or fine-motor skills necessary for legible penmanship.

Problems in penmanship may be caused by visual-perceptual difficulties, uncoordinated motor movements, inattention, or language disturbances (Smith, 1983). For some students visual perceptual difficulties are observed in problems in revisualizing or mentally picturing a letter or letter sequence. For others, uncoordinated motor movements are observed in a lack of hand or arm control in writing. Still others may not observe errors, or know how to correct them.

According to Johnson and Myklebust (1967), the disturbances in written language (dysgraphia) observed most frequently are three main types (the first two are of interest in this study):

1. A disorder of visual-motor integration; the person can speak and read but cannot execute the motor patterns for writing letters, numbers or words. He may be able to spell orally but cannot express ideas by means of visual symbols because he cannot write. This condition is designated dysgraphia.
2. A deficit in revisualization; this individual recognizes words when he sees them and hence can read. However, he cannot revisualize letters or words, so he cannot write spontaneously nor from dictation. He cannot evoke the visual image from hearing the spoken form.
3. A deficiency in formulation and syntax; in this instance the person can communicate orally, can copy, can revisualize and spell words correctly, but he cannot organize his thoughts into their proper form for written communication. He does not write the way he speaks; he makes errors in written formulation that he does not make in speaking (Johnson and Myklebust, 1967, p. 199).

Dysgraphia is a problem of integration. The learner does not have a defect in the visual or motor systems, but he/she cannot transfer information from the visual to motor system. According to Johnson and Myklebust (1967),

> He sees what he wants to write but cannot ideate the motor plan. As a result he is unable to write or copy letters, words or numbers. It is the inability to copy which differentiates dysgraphia from the other disorders of writing. The dyslexic, for example, cannot write because he cannot read; yet he can copy. Similarly, a child with a visual memory disturbance can copy but he

cannot write spontaneously because he cannot remember how the letters look. (p.199).

For some students, writing is difficult because the learner has no idea how to make the symbols. Even if the learner watches another writing, he/she may have no idea how to make the sequences and direction of movement because part of what he/she needs to see is covered by the writer's fingers. There are many degrees of dysgraphia. Those with the worst problems are unable to hold a pencil properly or draw a straight line. These learners cannot imitate what they see.

The learning disabled may have difficulty writing because they cannot maintain satisfactory writing posture. Good writing posture means feet placed on the floor; arm on the desk; and pencil in an acceptable grasp. According to Johnson and Myklebust (1967),

> Children with learning disabilities often have poor writing posture. Some keep their heads too close to the paper; others move constantly and as a result slide their paper or cover their work with their arms so they cannot see what they are doing" (p. 204).

Methods Used With the Learning Disabled

There is a debate today over whether to teach printing or cursive first to beginners. The debate also affects those in need of remediation. Which method is best? A case can be made for both methods. Hagin (1983) suggests the following:

> Manuscript is advocated for beginners for a number of reasons:
>
> 1. It is regarded as being easier to learn because the letter forms are simpler.
> 2. It resembles the printing in books, so that the child does not have to accommodate two graphic styles.
> 3. Beginning writing in manuscript is more legible than cursive.
> 4. It is required through life in applications and documents.
> 5. It promotes independence of letters within words in teaching spelling.

A strong case has also been made for cursive writing in recent years, particularly as a beginning approach for teaching the learning disabled children.

1. The connected cursive style permits the learner to deal with words as units.
2. The individual letters are difficult to reverse, in contrast to the manuscript letters.
3. Cursive writing is faster than manuscript because its flow does not require the separate movements of the pencil for each letter. (p. 267)

Connell (1983) writes that "chancery cursive" or D'Nealian is faster, less prone to reversals and lays a strong foundation for later joined words. He questions the use for the learning disabled in the following words:

> On the other hand, five- and six-year old beginners, and older pupils with some weakness in coordination, often cannot stop on the upswing "tails" on the end of chancery cursive letters. Instead of ending in a "tail," beginning letters tend to look as if they were followed by the letter u (p. 415).

In a study conducted by Oglesby (1982), the penmanship skills of six below average second grade students using D'Nealian was compared to six below average students using the Zaner-Bloser method. The students were trained for nine weeks. Evaluations were conducted every three weeks. The skills evaluated were letter formation, size, slant, spacing between words, legibility, spacing within words, and alignment. The results of the nine-week study showed that the D'Nealian group scored substantial higher in all categories. The D'Nealian group consistently scored higher in legibility and letter sizing throughout the study. The results were attributed to the effects of the "continuous stroke" method.

Hagin (1983) suggests some necessary conditions for acquisition and remediation of penmanship skills:

1. The style of writing should be appropriate to the child's level of motor control so that the initial chain of isolated motor impulses that produce

the graphic form of the letter can gradually be mastered and transformed with a reasonable amount of training to the "kinetic melody" that is mature handwriting.

2. Handwriting should be taught not just as a visual task, nor just as a motor task, but as a process that involves body image, spatial orientation, awareness of kinesthetic feedback and temporal sequencing; a handwriting program must take the full process into account.
3. The approach must give the child practice with visualizing and revisualizing the graphic form of the letters being taught.
4. The use of verbal cues, shared with the adult teacher at first, and then gradually faded out until they become sub-vocal in the child would help to establish control over voluntary movements.
5. Teaching should be direct, not causal; individual, not group. There should be adjustment to individual rates of mastery. There should be specific training with the elements of the process and provision for transfer to spontaneous writing.
6. Children should be taught to monitor their work and to make corrections on the basis of this feedback.
7. There should be opportunity for overlearning through spaced practice.
8. Finally, handwriting should not be dismissed as a simple task for these children. Many of them carry with them the burden of past failures. The system must provide concrete evidence of successful attainment of many short-term goals, as well as that infamous long term goal "Write neater" (p. 268).

Hagin (1983) designed a writing program to meet the needs of the learning disabled.

The system is a simplified writing method based on a vertical downstroke, manuscript letters and connecting strokes. Handwriting position is emphasized and is taught through four steps:

1. Writing hand--The writing hand holds the pencil in an oppositional (pincers) grip.
2. Helping hand--The helping hand rests at the top of the page to keep the page from slipping away as the writing hand moves across it. It is also ready to move the page up as the work proceeds.
3. Page--The page is placed with the longer side parallel to the writing arm, slanting diagonally on the desk. This means that left-handed writers are helped to avoid the "hooked arm" position which places so much stress upon the wrist of the writer.
4. Elbow--The elbow is anchored on the desk so that the arm, as it pivots, can reach across the page without repositioning (p. 269).

According to Hagin, letter forms are taught through five patterns based on the work of Kephart (1960). The patterns are the foundation for letter families. Instruction is given using the chalkboard. As shown in Figure 1, the following movements are used:

Waves	the foundation motif for a, c, d, g, q
Pearls	the foundation motif for e, i, h, j, m, n, u, y, z
Wheels	the foundation motif for o, v, b, w, x
Arrows	the foundation motif for k, l, t, r, f (p. 270)

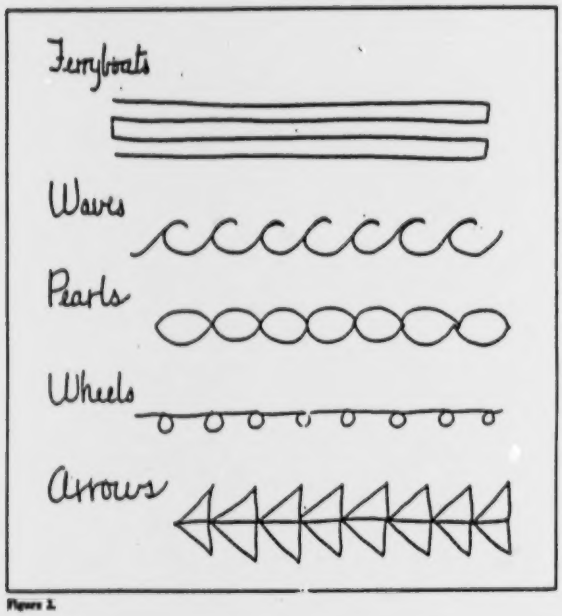


Figure 1. Taken from Hagin (1983) with permission.

Hagin's approach to handwriting, called Write Right--or Left, uses four steps: Trace, Try, Match, and Mastery. In the tracing stage, acetate sheets are placed over the printed model. Verbal cues directing movement are used with the teacher giving the directions. At this stage, unlimited guided practice is given. In the Try stage, the student is given an opportunity to write the letters without a model, but on the acetate sheet which is placed over lined paper. In the Match stage, the student puts his/her acetate sheet over the printed model. With the teacher, the student judges whether the writing matches the model or whether more practice is needed. At the Mastery stage, the student is permitted to write on paper to record progress.

A similar approach to Hagin's is that of Heyman (1977) who suggests pre-writing chalkboard exercises using cursive. Denison and Dennison (1986) suggest the chalkboard exercise "Lazy 8" as pre-writing skill to promote whole brain integration and directionality. The idea is to get the child to cross his own body midline in writing on the board.

Cursive has often been suggested as a preferred method for teaching first grade learning disabled children. Early et. al (1976) found that while using cursive exclusively did not make a significant difference in reading and spelling, the learning disabled had fewer reversals and transpostional errors.

In a study conducted at Avocado Elementary School in Homestead, Florida, Mc Millan (1985) found through a specially devised cursive handwriting program that learning disabled children in grades 2 and 3 could improve their writing skills. The program combined tracing and behavior modification techniques in a sequential, structured program over a nine-month period. Several steps were included in each of the sequences which included tracing, copying, and reproducing letters from memory. These were followed by words with and without a pattern, and then sentences. Multi-colored lined paper was also used with different sized spaces, before finally using regular notebook paper.

One hundred percent of the third graders were able to produce average or above average cursive handwriting samples 80% of the time. Seventy-five percent of the second graders were able to do the same. The difference in percentages may be due to age and experience factors between the two grades. The behavior modification program included stars which could be traded at the end for a slice of pizza. This method appeared to be especially useful for the learning disabled student who did not exhibit severe disabilities in visual discrimination and memory.

Farrell (1988) says that to teach handwriting instruction, teachers need to teach the basic strokes of horizontal, vertical, outward, inward, and diagonal lines. She suggests using the chalkboard and overhead transparencies for student practice. To teach the connection from manuscript to cursive, the transparency is projected onto the chalkboard where students can trace and connect dotted lines to form the cursive letters. Colored chalk is used to color-code the straight and dotted lines on the board. Tracing is first done with the finger, then with chalk. Seat work follows the board activity. Farrell uses clothespins

to help students develop better finger control in holding their pencils. When students pinch the clothespins, they improve fine-motor control enabling them to hold their pencils better.

Storch (1987) suggests six strategies to help learning disabled students improve handwriting skills. They include the following:

(1) creating an interest and a reason to improve handwriting skills

(2) boosting confidence by letting the students become "role models"

(3) use of grips to assist handwriting

(4) relaxation techniques

(5) self-instructional procedures with verbal assists

(6) self-instructional materials with self-monitoring prompts (p. 3).

Storch suggests that a way to create an interest and reason to improve handwriting skills would be to have students write letters. Citing Giordano (1984) and Reetz (1987), Storch says that letter writing has been shown to be an activity that may stimulate children to write legibly. Letter writing, according to Reetz, seems to stimulate greater student interest in sentence formation, length of written material, and overall legibility. Storch suggests pen pals from another class or school. In building student morale, Storch suggests letting the students become "role models." She says this might be accomplished by having students write summaries of books for younger children. Giordano (1984) found the following to be helpful: pencil grips such as large beads or modeling clay which can be formed around the pencil could be useful to help relax student pencil grip. Relaxation techniques which included prerecorded taped instructions on how to relax may also be helpful.

Self-instructional procedures combine the visual and auditory modalities. These have been shown to be successful in a few studies (Kosiewicz, 1982; Graham, 1983). Self-instructional materials with self-monitoring prompts such as task cards enable students to work independently and to be able to silently check the assignment. The cards contain such

questions as, "Is my pencil in the proper position?" The child checks the answer on the card to evaluate his/her own performance. Personal graphs help to record progress.

Graham (1983) examined the effect of self-instructional procedures on LD students' handwriting performance. The study was conducted on three students in three special education resource rooms in different schools. The students ranged in age from 10-4 to 11-7. The study replicated a study by Robin, et al. (1975) who investigated the performance of kindergarten students. The study was designed to determine the effectiveness of a self-instructional procedure in improving and maintaining the letter-formation skills of LD students with writing problems.

The students were asked to write six lower-case manuscript letters five times each day. The letters consisted of two training letters and four generalizational letters. In the treatment stage, students were told they would learn to improve their handwriting. Modeling was used. First, the students watched the teacher. Next, the teacher wrote the letter while verbally describing the process. Finally, the student traced the letter with his/her index finger. This was repeated until the student could trace and verbalize the steps. Then the teacher wrote the letter and traced it with a pencil while asking questions like, "What do I have to do to write the letter?" Students were encouraged to talk to themselves and to monitor what they were doing. The process was continued until the student was proficient in forming the letter and verbalizing the process correctly. This treatment lasted for ten days and was followed by a modified treatment for ten more days. Graham says that the procedure proved to be moderately effective. A follow-up showed that gains which were made during treatment were maintained over time. Graham says that generalization to regular classroom performance did not occur. He suggests that self-verbalizations are difficult for the students, and that the treatment methods may have been too complex. He also says that a limitation of the study may have been an inadequate number of student treatment sessions.

Kosiewicz, et al. (1982) studied the effects of self-instruction ("use the directions to do your assignment") and self-correction procedures ("correct the previous day's work") on handwriting performance of a learning disabled boy aged 9-11. Cursive was used in this study and word lists and paragraphs were used as opposed to single manuscript letters. In the six-day phase, both strategies were used simultaneously. Three base lines were established during which time no strategy instructions were given. After each base line, the treatment strategies were reinstated. Later in the study, treatments were alternated each day, with simple instructions to "correct the previous day's work," or to "use the directions to do your assignment." The results of the study indicated that the combined treatments were practical and simple.

Conclusion. In conclusion, the teaching of handwriting must relate to its development in children. The D'Nealian system of penmanship may be the best one for the learning disabled, and Hagin's approach to remediation may be the most sensible.

Spelling

Spelling is difficult and complex. Grant (1985) writes that "Spelling is the one subject which encourages neither creativity nor divergent thinking. Only one pattern of letters is correct" (p. 459). Johnson and Myklebust (1967) say that "Spelling requires more auditory and visual discrimination, memory, sequentialization, analysis and synthesis, and integration simultaneously than perhaps any other skill" (p. 239).

Spelling involves three basic sources of information for all learners. Learners utilize "their knowledge of letters, their knowledge of the spelling system and their memory for the specific words, referred to as lexical knowledge" (Ehri, 1989, p. 35). Knowledge of letters means knowing the letter names and sounds. Knowledge of the system refers to knowing how to segment words into phonemes. Lexical knowledge means remembering the sequence of the letters in words and how the letters symbolize the phonemes or sounds.

Acquisition

The process of learning to spell has been shown to progress developmentally in several studies. The phonological relationships pre-schoolers make was examined by Lieberman & Shankweiler (1987) who reported on their 1974 study which investigated whether the children could identify individual phonemes and syllables within spoken words. Lieberman found that by age four none of the children could identify individual phonemes but 50% could identify the number of syllables. By age five, less than 20% of the kindergarten children could count the phonemes and 50% could count the syllables. Lieberman found that by age six, 70% of the children in this study could segment by phoneme and 90% by syllable. Phonological awareness seems to improve significantly just about the time children are learning to read and spell.

Phonology refers to the sound system of our language which includes the general rules such as pronunciation, morphographs, and word endings. Read (1971) studied the spellings of pre-school children and found that they had acquired phonological relationships. He found that "children can (and to some degree, must) make abstract inferences about the sound system of their language before they learn to write" (p. 32). Read calls the way the children write "invented spellings." When children write, they are categorizing even though their spellings are not standard English. He believes that in this process of abstraction (attention, analysis, and synthesis) the children are trying to make sense of the language even though they haven't learned English orthography.

A study by Beers and Henderson (in Swartz, 1983) discovered developmental stages in children's early spelling and writing. The stages were summarized by Swartz as:

1. Semi-phonetic, e.g. BK/bake
2. Phonetic, e.g. BAK/bake
3. Transitional, e.g. BAEK/bake
4. Correct, e.g. BAKE (p. 304).

This study was conducted on twenty-five first graders. In the semi-phonetic stage, the children knew that letters had sounds and that the letter or grapheme represented a sound. At this stage the child is able to write only part of the word. At the Phonetic stage, the child can write the symbols for the sounds he hears BAK/bake, but does not have the necessary conventions of orthography such as final e. In the Transitional stage, the child is making use of visual cues and is moving away from the reliance on phonology BAEK/bake. Both vowels and consonants are represented. At this stage the child is learning the morphemes and markers such as final e. This sequence of development was found in spelling patterns of children in the study regardless of the method of instruction.

Gerber (1984a) analyzed studies of the developmental factors in spelling and concluded that in general, these studies of young, normally achieving students can be interpreted to mean that acquisition of spelling ability is:

1. linked to an emerging understanding of what words are and how they function in written communication;
2. related to a series of invariant stages or levels of orthographic awareness and knowledge, which manifests itself as a series of successively better approximations to the conventional spelling system;
3. revealed by the quality (i.e., structure and completeness) of spelling attempts when students experience initial response uncertainty;
4. different from achievement, in which attainment of relative automaticity in responding results in correct spellings of specific sets of words (p. 158).

The idea that spelling is a developmental process is further supported by Bruck (in Swartz, 1983) who followed the progress of 100 learning disabled children. He found that for those still practicing language skills, "progress in reading and spelling continues into

early adulthood" (p. 312).

Ehri (1989) suggests that the different stages of spelling development represent information about the child's knowledge of the spelling system. She believes that by the time a child reaches the phonetic stage he/she has an easier time remembering the correct spelling of words than the semi-phonetic stage spellers. The reason is the knowledge about the spelling system becomes schemata for the speller to make sense out of the spelling words and to remember them. Ehri recommends that children may need to learn how the orthographic system works phonetically before they become able to remember the correct spellings of very many English words.

Teacher style and methods used in reading and spelling instruction were significant variables in a study conducted recently by Jimenez and Rumeau (1989) which included 260 elementary school children in first and second grades in the Canary Islands. Although no children were specifically labeled learning disabled, the children were from various economic classes. The purpose of the study was to investigate writing disorders of children by studying how those children were taught. The children were placed in one of the three groups according to the teacher's instructional style of teaching reading. The groups were (1) global-natural method, (2) syllabic method, and (3) phonic method. The study was conducted over a two year period.

The students in the global-natural method were taught by using meaningful sentences in cursive. The children had to reproduce the sentences written by the teacher on the blackboard. These students were taught cursive first. The syllabic group put less emphasis on meaning and stressed the oral reproduction of syllables in the early stages. The phonic method stressed analysis of phonemic elements. Manuscript writing was taught to the syllabic and phonic groups.

The students were assessed on copying and written dictation. The idea was to compare writing behaviors with the type of reading instruction the children received. After two

years of instruction, an analysis of the types of spelling and writing errors showed that those errors were different for each group based on how the children were taught. Pupils taught by the global-natural method made errors in similar looking letters. This indicates that this type of error is related to the reproductive aspect of language. With the methods that emphasize decoding, or bottom-up processes (phonic and syllabic methods), a great number of errors concerning meaning were observed. Those errors were mixing of letter order, and incorrect unions. Jimenez and Rumeau suggest that those errors may be caused by undue emphasis on rote learning of grapheme-phoneme relations in early reading and writing instruction. They suggest that as the students advance through the grades, the students taught through the global natural method would be more productive writers.

Problems in the Learning Disabled

The difficulty that the learning disabled have in learning to spell may be related to hierarchial skills which have not been automatized, may be the result of sensory deficiencies, or may reflect problems with memory. Sensory difficulties which include the inability to sound out words may be the most severe. Spelling disorders could also be related to a lack of understanding of the spelling system.

Spelling in the learning disabled will be examined under the following three headings: Developmental Stages, Information Processing, and Etiology of Deficiencies.

Developmental Stages. Swartz (1983) studied the spelling ability of learning disabled students and the developmental sequences of spelling which the learning disabled find difficult to master. The study compared the age-related changes in the ability of learning disabled children to abstract spelling patterns to those of normal children, and to assess the strategies the learning disabled used as they abstracted these patterns. Swartz's study included a total of 180 children aged 8-10 (20 Good Spellers, 20 Poor Spellers, and 20 Learning Disabled Spellers). Three tests were used: Test I was a multiple choice test of nonsense words; Test II was a multiple choice test of real words; In Test III, the children had

to write nonsense words from dictation. Each test contained words with 30 patterns including plurals, past tense, possessives and adjectives. On all three tests,"Good Spellers" performed significantly better than "Poor Spellers" and the "Poor Spellers" performed significantly better than "Learning Disabled Spellers." Swartz believes that the learning disabled are considerably delayed in their ability to abstract spelling patterns. Swartz (1983) found that the following.

> At ages 8 and 9 years the Learning Disabled spellers showed little ability to abstract patterns on the most difficult Tests I and III (nonsense words). . . . On all three tests the Learning Disabled group showed little if any change from 8 to 9 years, whereas from 9 to 10 years there was considerable improvement in performance. . . . They (10 year old Learning Disabled spellers) were at the level of 9 year old poor spellers, but not up to the level of 8 year-old Good Spellers and well below the youngest Good Spellers (p. 310).

Swartz's study concluded that the learning disabled, even at age 10, were functioning at the semiphonetic stage and their performance was similar to that of beginning or pre-school spellers. The types of errors they made indicated difficulty "in either the ability to segment words into phonemes and/or the use of sound/symbol correspondence. This supports the findings of classification studies that the ability to spell phonetically is an area of difficulty for the learning disabled" (p. 311). Swartz also suggests that the non-standard responses indicated that the learning disabled have difficulty with the morphological and visual representations of spelling and this indicates problems in sequencing, perception, or recall.

Gerber (1984a) explored the viability of a developmental model of spelling acquisition for learning disabled students. An assumption was made "that LD spellers would perform more like younger, normally achieving peers than in accord with models of neuropsychological deviance" (p. 158). One of the ideas that his research questioned was

the accuracy and pedagogical implication of assuming that because of spelling errors LD students are deficient in processing. The students in the study were learning disabled aged 7 -12, and between the 2nd and 6th grade. They showed a significant discrepancy between tested achievement and expected achievement in reading and math. They had no physical or sensory impairments.

The study "sought to look at the qualitative differences among the spelling errors based on the hypothesis that general classes of errors were associated with qualitative differences in cognitive maturity" (Gerber, p. 159). Spelling attempts were rated on a five point scale: Preliterate, Prephonetic, Phonetic, Transitional and Correct. The question of the analysis of the spelling errors was "whether LD students produced errors which could be interpreted as aberrant, random or unintelligible" (p.160). The results indicated that there was nothing deviant or unintelligible in the errors of the LD students. A comparison between normal achieving students grades K,1,2,4,5,6 showed that LD student error types were the same types as made by younger normally achieving students who were three to four years younger.

Gerber's second study replicated and expanded upon the first study. A longitudinal analysis (5 months) was added and a quality analysis was applied to a different set of phonetic-orthographic features. The results supported the first study. "The most significant finding was that spelling-quality ratings tended to increase incrementally for within-subject longitudinal comparisons of attempts to spell the same words" (Gerber, p. 160).

Bailet (1990) conducted a study similar to Swartz's comparing the spelling performance of learning disabled students with that of normal achieving students the same age and younger. The spelling battery consisted of tasks with phoneme-grapheme correspondence rule usage and four tasks of suffix rule usage. The results of the study supported those of Swartz that spelling acquisition of derivational forms of words proceeds

developmentally and their spelling error patterns were highly similar to those of younger normal achieving spellers.

Information Processing. Information Processing refers to the learner's ability to understand the information received (receptive language) and to express what he knows (expressive language). Besides developmental factors in the learning disabled, Information Processing has been a model to explain individual differences in learning to spell. According to Gerber and Hall (1987), the problems of the learning disabled can be divided into two types: "process" and "structure." "Process" means the type of difficulty that can be remediated through instruction; on the other hand, "structure" problems are difficult to remediate, such as the coding deficiency of auditory processing, discrimination, sequencing and memory.

The learning disabled may be deficient in visual, auditory or both processes in learning to read and spell. Moreover, the degree of these deficiencies may vary within the learning disabled population. Auditory weaknesses may be the most predominate and most severe among the learning disabled. Boder (1973) found that over 60% of the learning disabled students had a phonetic weakness, less than 10% a visual weakness, and that 20% had both patterns at once. Those with both visual and auditory difficulties may have the most severe spelling problems.

Receptive and expressive language involve visual and auditory components. An impairment in one or both components may impact on the learner's ability to understand and to communicate language. The impairment may delay normal language acquisition. Deficiencies in visual or auditory processing of language may impair the learner's ability to speak, read and spell. Examples of the reading and spelling patterns of children with visual or auditory processing problems are shown in Appendix B.

Fox and Routh (in Williams, 1986) studied the phonetic abilities of severely disabled readers. The first study (1980) found that severely reading disabled first graders

performed significantly more poorly on phonemic segmentation than normally achieving peers. In 1983, a follow-up study reported on the progress of some of the original students in the study. They found that "the disabled readers were deficient in phonetic spelling ability and they showed a tendency to make bizarre errors. Many of them could be characterized as 'disphonetic spellers'" (p. 412)

The learning disabled may be deficient or limited in processing information resulting in limited achievement. Mann (1986) suggests that the learning disabled may reach a premature plateau. Fox and Routh suggest that the disabled continue to have problems in reading and spelling into adulthood. What may show up as a reading problem in the early grades, is seen later as a lack of phonetic spelling ability.

The learning disabled have been shown to be deficient in "ordered recall of strings of nameable objects, letters, digits, nonsense syllables, or words, whether the stimuli are presented by ear or by eye. They also fail to recall the words of spoken sentences as accurately as good readers" (Mann, p. 145). Typically, these are functions of short-term memory. The difficulty the learning disabled have in phonological aspects of spelling may be related to deficiencies in short-term memory and not just to phonological language processing. The difficulty may also include the problem of retrieval of letter sounds or morphological units. The learner may receive the information, but not be able to express what he/she knows in the encoding process of spelling.

Many learning disabled have difficulty attending. Attention can be measured as a level of awareness. It is knowing what is going on around you. Some theorists such as Broadbent (1958) and Horton and Turnage (1976) believe the learning disabled may suffer from selective attention which "is the process of making a distinction between information that is attended to and that which is ignored at the moment" (in Hynd, et al. 1987, p. 189).

Etiology of Deficiencies. The origin of processing deficiencies whether visual, auditory, memory, etc., is debatable. Perhaps a neurochemical or anatomical deficiency may

delay or obstruct the brain functions preventing or delaying language acquisition. Luria (1966) found that brain lesions interfered with the language functions. Hynd (1987) says that this type of research has been continued by Galaburda and Kemmper (1979), Galaburda and Eidleburg (1982) who found problems in the cortex, and Drake (1968) found an abnormal convolutional pattern in the parietal lobe around the angular gyrus. This evidence supports the neuropathological basis of learning disabilities. There is some evidence that processing deficiencies may be inherited. Olsen and Pennington (1990) suggest that "the inability to read and pronounce words based upon the sound values of letters, letter groups and syllables, may be linked to a gene on chromosome 15 in some dyslexic families" (in Behrmann & Robinson, Eds.,1990, p. 18).

Conclusion. Whether the learning disabled are deficient in processing or whether they experience a maturational lag in development is not definite. What is known is that the learning disabled experience difficulty acquiring language skills in speaking, reading, and spelling. Phonological awareness which has shown to develop in 6-year-old normally achieving students does not develop at that age for the learning disabled. Therefore, the learning disabled have shown to be deficient in processing language at this critical age (Kass, 1986). However, if the visual and auditory processing are not the real problems, perhaps the problem is difficulty with short-term memory, or with metacognition which is knowing about one's own learning patterns.

While the difficulties in learning to spell are pervasive in the learning disabled group, researchers believe that spelling improvement is possible. Gerber and Hall (1989) fault the type of spelling instruction all children are given for poor achievement. Quality spelling instruction is essential for the learning disabled. Today, research is focusing on spelling instruction and problem-solving strategies to enable the learning disabled to use the abilities they have to become better spellers. Kass' (1986) Critical Age Theory suggests that identification and remediation for the learning disabled must occur during the "critical

age" or future learning will be negatively affected.

Methods Used with the Learning Disabled

Normally achieving students seem to acquire spelling to automaticity and seem to develop spelling skills at appropriate ages. The learning disabled do not. The spelling skills of the learning disabled tend to be three to four years below normal achieving students (Gerber, 1984). In addition to exploring the problems within the individual learners, it is important to examine the methods of instruction and remediation.

An examination of classroom spelling instruction has led to criticism of classroom practices in general. Gerber (1984b) says "First, teachers don't teach spelling much. Second, despite the fact that teachers are often familiar with effective techniques, they unaccountably fail to use them. Third, schools simply don't permit atypical learners sufficient time (or opportunity) to learn" (p. 50). Ehri (1989) believes that the phonological deficits which dyslexics have are related to their lack of knowledge of the spelling system and due to inadequate instruction.

Methods of remediation have been organized under the following types: Multisensory Instruction; Reduced Unit Size, Distributed Practice, and Training for Transfer; Error Correction; Phonetically Regular or Irregular Words; Problem-solving Strategies, and Computer-based Programs. Those approaches are examined in this paper.

Multisensory Instruction. The multisensory approach is based on Samuel Orton's (1937) theory of cerebral dominance and language acquisition. Orton suggests that reading disorders are the result of one hemisphere of the brain not establishing dominance over the other hemisphere. Orton believes that the language skills of reading, spelling and penmanship are integrated and interdependent. Orton suggests that remediation must include new and different instructional methods for teaching reading, spelling and penmanship. Orton believes that the integration of the visual, auditory, and kinesthetic systems builds associations between the systems. Orton stresses spelling training through phonetic

analysis. His remediation includes repetitive oral and written drills, the tracing of letters and repeating of sounds at the same time. His associates, Gillingham and Stillman (1956) published a manual containing many of the methods and techniques developed which were based on Orton's theories.

Grace Fernald (1943) further developed Orton's methods. The Fernald method is a multisensory, whole-language program which combines reading and writing into a comprehensive program where separate skills are de-emphasized. In this system, cursive, syllabication, and meaning are united in writing and reading, making the production of language the first emphasis. Reading follows writing. Her method for reading and spelling combines the kinesthetic technique of tracing the whole word with the phonic associations of saying the sound and looking at the whole word.

The Fernald method or technique consists of four stages. In the first stage, the child learns by tracing words. The word is written in crayon or marker in chalkboard-sized script or in manuscript print. The child traces the word with his/her finger pronouncing the word while tracing. This is repeated until the child can write the word without looking at the copy. The child can progress learning each word for his/her own story using this procedure. When the story is finished, it is typed for the child and he reads it in print. Letters are not learned in rote fashion but within the context of meaningful words and sentences. The child continues using this tracing method until all words are learned. This may take from two to eight months. All words learned are filed in the child's personal file box.

In stage two, tracing is no longer needed and the child is able to look at the word, written in script, saying it to him/herself and then write it without looking at the word. The idea is to make the connection between the sound, the word, and the form. In polysyllabic words, each syllable is pronounced as it is written. The words continue to be used in longer and more complicated stories, which are typed for and read by the student.

Stage three eliminates having the word written in script for the student. By this stage, the student is able to look at the printed word, say it to him/herself, and to write it in script from memory. The child starts reading from books at this stage. Words learned continue to be reviewed and placed in the file.

By stage four, the student is noticing parts of words in new words from past learning. New words that the student doesn't know are told to him. The student then says the word as he looks at it , writes the word in cursive, and repeats the word without looking at it. The training continues until the student is able to read class assignments. Fernald reported retention or words to be 80 to 95 percent, and skills in phonics are learned without having been taught formally .

While tracing is used for remediating of a reading disability in Stage 1, Fernald believes that is not necessary if spelling is the only problem. In spelling, the word must be written until the writing of it becomes automatic. Fernald's criticism of spelling education concerns the way in which children are taught. Among those ideas criticized are "picturing the word, " "oral spelling," and copying.

Nina Traub's Recipe for Reading (1982) is also based on the Orton-Gillingham approach. The Traub Systematic Holistic method involves the controlled introduction of phonetic elements. It begins "by introducing only seven lower-case consonants and two lower-case short vowels" (p. 139). The pupils are taught to read words first. Words are gradually introduced in writing and reading of phrases. Many different games are used as drill techniques to develop automaticity. Spelling is combined with writing and reading in this highly structured program.

Traub's method was used in a validation study conducted in 1976, in a public school in Ossining, New York. The study compared the gains of Traub's students with second-grade students from another school district. The Ossining Tutorial Program included 25 students. Three tests were used in measuring the performance of students: Woodcock, CTBS, WRAT.

Results from this study showed that the students in the Traub program made significant gains in grade level scores in reading and spelling over the control group. Additional federal grants enabled Traub to continue to implement the Ossining Tutorial Program in other school districts with similar results.

Vickery et al. (1987) report that the staff at Texas Scottish Rite Hospital Language Laboratory in Dallas, Texas, developed the Alphabetics Phonics Program which was originally based on the techniques of Orton. Their research was conducted from 1965-1975, and the program was expanded to include not only the work of Orton, Gillingham and Stillman but also Bruner, Piaget, Fernald, Bloom and others. Whereas Gillingham recommended remediation on an individual basis, the Alphabetics Phonics program was expanded and refined to be used with small homogeneous groups of dyslexic students. These ideas were later incorporated into the Multi-sensory Teaching Approach for Reading, Spelling and Handwriting (MTARSH). The MTARSH Program was designed for and was implemented in the Greenville Independent School District's regular education classrooms from 1977-1981.

The MTARSH Program is designed for mastery learning based on the models of Bloom (1968) and Carroll (1963) as well as the reading stages described by Chall (1983). Alphabet and dictionary training, cursive handwriting, reading and spelling are organized and taught for mastery learning. The structured program teaches phoneme-grapheme correspondences and spelling rules. Teaching directions are very specific for initial instruction. Review and practice and are based on a skill hierarchy and criterion-referenced mastery. Frequent checks are included for evaluation of mastery. Comprehension skills are taught through verbal expression at an oral level and progress to a written level. A management system enables teachers to record practice sufficiently to attain mastery criteria (90-100 percent) for each concept or skill (Vickery et al., 1987).

Two basic procedures are used: synthesizing phonics and memorizing whole words.

For phonetic or regular words students are taught techniques to sound out words. For irregular words, students are taught to memorize the words using the whole-word method developed by Fernald. The mastery steps include introduction, review and practice. The key idea is that "the smallest units of written language, letters and clusters, are taught simultaneously for reading, spelling, and cursive handwriting, using the multisensory steps recommended by Gillingham and Stillman" (Vickery et al., p. 191).

During the four year period that the MTARSH was implemented, a total of 426 students in grades 1 through 6 received the instruction and training. Results of the study, as measured by the California Achievement Test, showed that mean scores for remedial and non-remedial students were above the baseline scores in all but fourth grade. Another trend was that the student scores correlated with the number of years the students were taught with this method. The longer the students were taught with this method, the higher the scores.

Grant (1985) believes that the kinesthetic (multisensory) approach to teaching writing and reading is more effective with children than conventional methods. In a study conducted in a non-public school, 44 first graders were taught using the kinesthetic method. They were tested in 2nd, 3rd, and 4th grades. The control group was taught by the conventional auditory-visual approach. They were taught reading followed by writing, then spelling. The experimental group was taught writing first, followed by spelling and reading. The children were placed in the groups based on kindergarten achievement. The "at risk" children were placed in the experimental group.

The children in the experimental group were taught cursive first, because some research indicates that cursive has fewer strokes, takes less time in the formation of letters, and has fewer reversals. The children were taught the letters according to the degree of difficulty of formation. The letters i, u, w, and t are the easiest. After the children mastered the letters, spelling was introduced. Phonetic word families were taught first. Hand gestures were taught for vowel sounds such as long e. Tracing and frequent

writing on the chalkboard were included. The experimental group was systematically taught skills in the mechanics of reading and comprehension. The control group was taught phonics and reading, well as manuscript printing before learning to spell.

In 2nd, 3rd, and 4th grades the groups were mixed and taught by conventional methods. The students' performances were tracked and assessed using the Stanford Achievement Test. The results of the study showed that by the end of 4th grade the "at risk" students equaled the control group in Paragraph Meaning, Language, and Word Study Skills, but were significantly higher in Word Meaning and Spelling.

Reduced Unit Size, Distributed Practice, and Training for Transfer. Failure of children learning to spell may be due in part to the type of instruction children receive. Gettinger (1984) examined learning principles as they apply to the learning disabled. Based on available research, Gettinger suggests that the three major principles are reduced unit size, distributed practice, and training for transfer.

Reduced unit size means cutting back the usual list of 15-20 words per week to three irregular (non-phonetic) words each day or four regular (phonetic) words each day. New words should be introduced daily, and students should not given the entire list the first day of the week. Spelling should be tested daily, with the teacher adjusting the number of words according to what the student can handle.

Sufficient and distributed practice means that practice should be conducted during several practice sessions with breaks built into the schedule. Besides daily practice and testing, the learning disabled need a systematic review of previously learned words. The practice of studying the words should be in isolation as well as in sentences. Spelling should involve writing.

In training for transfer, teachers should point out patterns of words. For example, that the ea in meat is the same as in beat, seat. The phonic generalizations must include the whole word and must be learned through multiple encounters with whole words.

"Generalization training for poor spellers needs to incorporate regularities in a more focused fashion and create a structure for transfer of training to take place" (Gettinger, 1984, p. 45). The emphasis must also include writing in sentences since spelling is not an isolated skill.

Results of research by Gettinger (1984) conducted in 1982 supported the three basic principles. Twenty-four learning disabled children aged 8-10 received a three-week instructional sequence that incorporated the following components:

> (a) teaching in small instructional units of only three (irregular) or four (regular) words each day;
>
> (b) mastery practice in which individual words were written to a criterion level of three consecutive correct trials and three- or four-word daily units were written correctly on two consecutive trials;
>
> (c) immediate and corrective feedback after each dictation;
>
> (d) distributed and cumulative practice whereby three- or four-word units were learned, reviewed, and integrated across the three weeks of instruction; and
>
> (e) sentence-writing practice that began with sentence fill-ins children filled in each training word on a worksheet as sentences were dictated), followed by sentence dictation and sentence generation: children wrote their own sentences containing training words (p. 46).

The progress of the learning disabled was compared to the progress of the control group where none of the principles was applied. The results showed that 75 percent of the learning disabled experimental group achieved a criterion level of 80 percent accuracy on training and novel transfer words, while only 13 percent of the control group achieved the criterion level.

Error Correction. Nulman and Gerber (1984) investigated the spelling performance

of learning disabled students when student errors were imitated. In Gerber (1984b), a case study on a fifth grade student showed that error imitation (and modeling of the correct spelling) was an effective remediation technique. Gerber analyzed the spelling performance of a student who was first pre-tested to find ten words she could not spell. The technique follows: When a word was spelled correctly, the teacher simply said, "That is correct." If the word was not correct, the teacher would say, "That is not correct. This is how you spelled the word." Then the teacher would write the incorrect spelling. After that, the teacher would model the correct spelling of the word. The student was given an opportunity to copy the correct spelling. Over a period of ten trials the results indicated that the student responses improved.

The words chosen for the case study were words that contained pattern or phonetic features that could be transferred to other words, such as ie, au, ou. Once the first list was mastered, a list with similar phonetic features was used to test and train for transfer and generalizible skills. The study demonstrated that the student could spell more words on the second trial and fewer trials were needed for mastery.

Phonetically Regular or Irregular Words. Ehri (1989) believes that phonological training combined with spelling training will improve reading. Spelling instruction enhances student knowledge of the spelling system, and the flow between reading and spelling develops. Students, according to Ehri, should be instructed to internalize spellings. Ehri argues that phonics training is not enough. Students should be taught how to invent phonetic spellings of words. Teachers must begin where the child is in terms of letter name or letter sound knowledge. Ehri says teachers should

> "Teach them how to detect additional sounds in pronunciations and how to symbolize these sounds with letters., for example, how to detect two sounds in consonant blends, how to spell sounds that are not found in letter names, very importantly, short vowels. One way to improve students' ability to detect

constituent sounds in words is to teach them to monitor articulatory as well as acoustic cues, that is, what their mouths are doing to pronounce words (pp. 360-361).

English spelling is at least partly phonetically consistent. The value of teaching invented spelling as suggested by Read (1971) and Ehri (1989)helps students to internalize and make sense of the spelling system.

Some remediation studies have included spelling words with phonetic patterns. A case study by Gerber (1984b) on a fifth grade student included words with phonetic features ea, ar, oo, that were transferred to the successive list. Results showed fewer trials were needed to master the phonetic features on the second list.

Orton (1937), Gillingham-Stillman (1956), Traub (1982), Beers and Henderson (1977), and Swartz (1983), suggest phonetic spelling and structured progression of spelling words. All focus on systematic phonetic spelling of morphographs, suffixes, prefixes and spelling rules. Swartz (1983) found that the ability to spell words with patterns was a developmental process and age-related. Students aged 9-10 made considerable improvement.

Bailet (1990), whose research comparing younger and normal achieving students with the learning disabled students' spelling, replicating much of Swartz' work, found that "children with learning disabilities do improve their spelling to some extent when provided linguistically based task structure that directs their attention to the critical morphological rule" (p. 127).

Graham (1983) says "Phonemic skills should be limited to base words, prefixes, suffixes, and consonant, consonant blend, digraph and vowel sound-symbol associations" (p. 562).

Research on learning disabled students using irregular or unpredictable words has produced some interesting results. Brown (1988) demonstrated that LD students could

achieve results in spelling unpredictable words when effective teaching practices are used. The study compared a control group with an experimental group using the ideas of reduced instructional unit size, cumulative and distributed practice, immediate error imitation and correction, direct instruction techniques, computer practice and attention to metacognitive strategies and proofreading skills. Brown concluded that the superior performance on unpredictable over predictable words using these techniques suggests that learning disabled students may have a preference for visual or lexical recall of words, and "There may exist a learning difficulty differential between phoneme-grapheme and lexical routes for some LD children" (p. 13). Brown suggests that the phonetic approach including rules, thinking about sounds etc., may make too many demands on the executive control function.

Gettinger (1984) suggests that phonic generalizations need to be applied in a focused and systematic way and within sentences to ensure a positive transfer to writing. Graham (1983) suggests teaching only the spelling rules that apply to a large number of words. Those would include rules for adding suffixes, final silent e, and doubling rule.

Problem-solving Strategies. Foster and Torgesen (1983) investigated two types of learning disabled children's study conditions in preparing for a spelling test. Their performances were compared to normal achieving students under three directed study conditions. The learning disabled were divided into two groups: those with normal memory, and those with severe short-term memory deficits. The study conditions were free-study, when the children studied the words in any manner; and direct study where repetitive spellings were made in letter chips. Words were spelled three times each. Results indicated that in delayed recall, the learning disabled with normal-short-term memory benefitted from the study procedure, whereas those with severe short-term memory deficits did not. Foster and Torgesen suggest that some learning disabled can benefit from specific directed study, but they need to be taught.

Gerber (1984a, 1984b), Hall (1984), and Gerber and Hall (1989) suggest that

the learning disabled should approach spelling as a problem-solving task. Hall (1984) says that students should be trained to monitor their own behavior as a means of using their cognitive resources. He suggests teaching students to use reasoning, proofreading, and uncertainty to produce alternative spellings.

Gerber (1984a), in a series of spelling studies, had students predict how well they thought they would do before they took a spelling test. They also taught the students self-monitoring behaviors as a way to cue information. The training included modeling, imitation, practice and self-verbalizations. Students were asked these questions:

Have I seen this word before?

Do I know any words that look/sound like this word?

What part(s) of the word am I uncertain about?

What are some different ways to write this word? (p. 162).

The performance of trained LD students was compared to that of untrained normally achieving students (NA). Students ranged in age from seven to twelve years old, in second to sixth grade. The results of the study showed that

(a) error quality improved for trained older (about 11 years old), but not younger (about 9 years old) LD students,

(b) error quality for trained older LD students was equivalent to error quality for untrained NA students at the same achievement level, and

(c) trained NA students produced higher quality errors than trained LD or untrained NA peers (p. 162).

Graham and Freeman (1986) trained students in a five-step strategy program and compared the performance of learning disabled students under three conditions: directed study, student-controlled and teacher-monitored. The five-step word study consisted of:

(a) say the word

(b) write and say the word

(c) check the word

(d) trace and say the word

(e) write the word from memory and check

(f) repeat the first five steps (p. 18).

Forty students were trained by modeling, practicing under direction, and by demonstrating proficiency. To demonstrate proficiency, the students had to apply the word study to two consecutive words without assistance. The students were tested on immediate recall of words. The results of the study showed that the students who were instructed in a study strategy and were instructed to use the procedure independently and/or received direct instructional assistance performed better than those who were allowed to study in any manner they chose. The study also showed that if students are proficient with a strategy, student controlled intervention can be as effective as teacher-controlled instruction.

The results of this study are consistent with the findings of others who found that students who were taught self-control study strategies could improve their writing performance, including handwriting and spelling.

Computer-based Programs. The invention of self-correcting typewriters and computers has provided schools with an alternative in adapting the environment for the learning disabled. From drill and practice of spelling words, to games to encourage thinking, to learning to use the word processor, the computer is a tool to be investigated. Some research has been done on regular education students, but the research on the learning disabled needs to be expanded.

Hanley (in Reith et al., 1984) suggests that computers provide a non-threatening instructional intervention. Computers are an escape from workbooks where many learning disabled have experienced failure. Many students maintain better attention to the task while using a computer. Polsgrove and Reith (1984) say that microcomputers provide a way to incorporate direct instruction into programs for children with learning disabilities.

Computer spelling programs can provide drill and practice activities the learning disabled need as repetition is important.

Reith et al. (1984) suggest that the Spellmaster, which program is an individualized computer based spelling program, can help the learning disabled. A teacher can design a program of up to 24 words per week to meet the individual needs of the student. The program provides for immediate feedback and unlimited trials to spell words. The management system allows teachers to monitor and record daily progress.

Chisholm (1987) suggests that computer assisted instruction should be a learning tool and not just a means for passive activity of drill and practice. Chisholm says word processing, data banks, and programs such as Logo offer the student a chance to be in control. Word processing allows the student to create his/her own written documents. With the spelling checker and cut and paste features, students have an opportunity to proofread their documents with help. Students see the highlighted, misspelled word and have an opportunity to choose a correct one from the built-in dictionary. Cut and paste features allow students to delete and move sentences and paragraphs in an easy way without laboriously re-writing by hand. Chisholm (1987) says, "There is no need to draw attention to the fact the writer cannot spell. The finished product does not reflect the struggle of the author as the reader sees only the polished piece of writing and not the revisions" (p. 33).

There have been few studies on word processing which include the learning disabled. Jacobi (1986) found that the program "Bank Street Writer" was motivational in a study which included four fifth-grade boys in a special education program. While the post testing failed to provide evidence of improvement from the pre-test, the use of the word processor was considered to be helpful in motivating students, promoting independence, increasing time on task and changing attitude toward writing. The most gains were noticed in a student who had poor handwriting skills.

A study by Kerchner & Kistinger (1984) suggests that the learning disabled make

gains in paper and pencil tasks as well as in writing after using the word processor. Bank Street Writer was also used in this study in addition to a pre-writing conference, and an editing conference with each student. They suggest that illustrations available in the program are useful to students using the word processor. In this study the pre and post testing were measured by the Test of Written Language (TOWL). Significant gains were shown to be made using the word processor.

In a study conducted by MacArthur and Graham (1987), the writing of eleven fifth- and sixth-grade students was studied using handwriting, dictation, and word processing. This study found that word processing in and of itself did not have a major impact on student writing. While the ease of revisions encouraged learning disabled students, it had little impact on their compositions. For the learning disabled the process of typing was slow. MacArthur and Graham suggest that systematic typing instruction should be incorporated as part of any major use of the word processor for writing instruction. They suggest that more research on the use and affect of word processors needs to be done.

Conclusion

Penmanship and spelling skills have been shown to progress developmentally in children. The learning disabled are developmentally delayed or deficient in processing during the critical ages when these skills are acquired. Instruction can ameliorate many of these deficiencies if it occurs during that critical period of development. Some deficiencies which are related to the "structure" of brain processes are difficult to remediate, and progress may be very slow. The central issue is early identification and remediation.

CHAPTER THREE

SURVEY AND RESULTS

Many learning disabled have been shown to be developmentally delayed or deficient in acquiring penmanship and spelling skills. Research indicates that these problems can be ameliorated through instruction. Chapter Two explored various types of remediation and the research which supports them. The question of this study was "What treatment methods and materials are Michigan special education teachers using to teach penmanship and spelling to the learning disabled?"

In 1972, a report was published by the Special Education Department at the University of Arizona, which included the results of a study on several aspects of special education. One of the questions of the study was, "How do we teach the child with learning disabilities, and what do we teach him?" (Bryant & Kass, p. 208). Bryant and Kass did a survey of members of the Council of Exceptional Children, the Division for Children with Learning Disabilities (DCLD), asking them to complete the following statements:

(a) Some of the materials and techniques I use the most in remediation are. . . .

(b) Some of the way in which I use the above materials and techniques are. . . . ,and

(c) typical problems for which I use the above materials and techniques are. . . .

Three hundred eighty-two DCLD members responded to the Bryant and Kass survey, and named 933 different materials and techniques which were divided into 15 categories. Twenty-seven percent of the responses named reading materials, 18% of the responses were so varied that they were classified as miscellaneous, 17%, visual-perception, and 10%, motor training. Spelling and writing received 1% each. Several multi-sensory materials were used in the teaching of reading, such as the Fernald VAKT, Orton-Gillingham, Gillingham, and Gillingham-Stillman, and Language Experience Approach. Other materials included the Merrill Linguistic Series, Science Research Associates (SRA), and Sullivan Programed Reading. In the areas of spelling and writing, no materials received significant

responses. Most teachers responded in terms of auditory perception, language development, motor training, remedial math, remedial reading, and visual perception.

The Final Report of the Leadership Training Institute in Learning Disabilities (Bryant & Kass, 1972) provided the foundation for the current study. In an attempt to answer the question, "What treatment methods and materials are Michigan special education teachers using to teach penmanship and spelling to the learning disabled?" a letter and a survey (Appendix C) was sent to 274 teachers in Resource Rooms and Self-contained Learning Disabilities Classrooms in the state of Michigan. All were members of the Michigan Association of Learning Disabilities Educators (MALDE).

In this study, 92 of 274 (34%) responded to the survey. The sample of the MALDE roster was prepared by Bruce Irland, MALDE Publications Chairperson. Only teachers of elementary school children in grades 1-6 were included. The statistical sampling included members of all regions of the state. Two surveys were received, but not included in the report because the teachers were retired, or were not teaching elementary school students. Ninety surveys were used in tabulating the data.

The questions in the survey covered methods and materials teachers used in elementary learning disabilities classrooms and resource rooms. Teachers were asked to be specific about methods and materials used in teaching penmanship and spelling. They were also asked how the methods and materials were used. Ten similar responses constituted a criterion of 11% agreement.

Penmanship

The procedure for reporting the results in Penmanship is divided as follows: Rank order of Methods and Materials, Definitions of Terms, and Discussion of Methods and Materials.

Rank Order of Methods and Materials

The results are numbered in rank order followed by the percentage of total responses:

Methods

1. Tracing 63%
2. D'Nealian printing 53%
3. D'Nealian cursive 52%
4. Air writing 47%
5. Writing in sand with fingers 39%
6. Self-instruction 28%
7. Other 27%
8. Zaner-Bloser handwriting 19%
9. Saltbox, writing with fingers 19%
10. Manuscript printing 18%

Materials

1. Ditto sheets for writing 50%
2. Finger-grip pencils 44%
3. Changeable plastic grips 42%
4. Color-coded paper 39%
5. Colored chalk 30%
6. Magic slates 19%
7. Handwriting workbooks 17%
8. Cursive tracing board 11%

When asked the question **"Is printing instruction given primarily by you as the LD teacher or by the regular education classroom teacher?"** 70% responded that regular education teachers provided the instruction. When asked the same question about **cursive** instruction, 67% said regular education teachers provided the primary instruction.

When asked, **"Do you combine printing and spelling instruction?"** 55%

said "Yes" and 42% said, "No." In response to the same question about cursive and spelling instruction, 52% said, "Yes" and 48% said "No."

In response to the question, **"In which grade is cursive introduced?"** 67% indicated 2nd grade, 24% indicated 3rd grade, and 1% indicated 1st grade (8% did not reply).

In response to the question **"Do you teach word processing for students who need to compensate for handwritten work?"** 41% said "Yes" and 52% said "No."

In response to the question **"Have you taught cursive to LD students in lower elementary instead of printing?"** 27% said "Yes" and 67% said "No."

Definitions

The **D'Nealian** and **Zaner-Bloser** methods of printing and cursive are described in Chapter Two.

Manuscript refers to the traditional Circle and Stick Method.

Tracing means that a student follows with a finger, or traces with a pencil or markers on the modeled form of a letter or letters. This may involve dittos, workbooks, sandpaper letters, tactile shapes or plastic overlays.

Air writing means to write the letters in the air using the entire arm and shoulder movement and involving the kinesthetic sense.

Writing in **sand** or salt trays (sugar, frosting, etc.) focus on the sensory tactile-kinesthetic methods to help children feel the letters.

Writing ditto sheets may be teacher produced or manufactured materials for a particular system such as D'Nealian.

Finger grips or **finger-grip pencils** refer to materials used to help children with poor fine-motor skills grasp their pencils better. The grips are placed where the thumb, index, and middle fingers combine to hold the pencil.

Self-instruction means the verbal steps in letter formation which students learn,

practice, and vocalize while writing.

Color-coded paper is paper with colored lines such as the red and blue Zaner -Bloser, or red, yellow, and green lined paper produced by individual school districts.

Magic Slates are manufactured tracing boards with plastic overlays. The pencils are plastic. No paper is involved. The letters are formed when the student writes with the plastic pencil and the image is produced on the plastic overlay. The letters are erased when the acetate sheet is pulled up.

Handwriting workbooks refer to the many series which may follow a particular method such as D'Nealian, Palmer, Frank Schaffer, or other version of the Roundhand style referred to in Chapter Two.

Discussion of Methods and Materials

The teachers' responses indicate that tracing and air writing are important steps in modeling the correct letter patterns, no matter what method or style of writing is used. Paper and pencil tracing, laminated cursive strips, and tracing the letter images projected on the chalkboard by an overhead projector, were the types of tracing named by teachers.

D'Nealian, Palmer, and Zaner-Bloser are distinct methods. They involve more than just a visual-motor approach to letter formation. D'Nealian includes steps for self-instruction, writing position, pencil grasp, and one-half inch sized paper. Palmer involves practice on oval shapes for pre-writing skills, and emphasizes writing position. Zaner-Bloser uses Circle and Stick for manuscript and offers two classroom methods, Traditional and Continuous Stroke. Zaner-Bloser teaches six basic strokes for manuscript, seven for cursive, and uses the stroke names as a self-instruction strategy. Zaner-Bloser teaches writing position for both left and right hands, paper position, and pencil grasp.

A significant 53% indicated D'Nealian printing, and 52% indicated D'Nealian cursive. Traditional Ball and Stick manuscript was named by 17% of the respondents and Zaner-Bloser was indicated by 19%. Several teachers responded that they taught writing based on

workbooks by Frank Schaffer, D'Nealian (Scott, Foresman) or Zaner-Bloser.

A few named methods or workbooks not included in the survey. Three named Handwriting Without Tears by Janie Z. Olsen O.T.R. Another method was Dettre Cursive by AVKO Products which was developed to teach cursive to adults. This method stresses pre-writing skills and shapes such as waves, canes, and sweeps. It utilizes the shape of the clock and numbers to indicate the pattern to follow in making letters. One teacher from the Grand Rapids system indicated she used the suggested verbal writing prompts suggested by the system as a means of student cueing and checking. Several teachers suggested chalkboard activities. One, in particular, was produced by Elsye Heyman, "Cursive Writing Begins With Chalk" in Teaching Exceptional Children. Children stand about one foot from the chalkboard. They are taught to stare at the "X" placed on the chalkboard rather than at their hands. The children learn to draw circles, and to attend to the rhythm of their body movement. Next, the children learn to make racetracks to cross the midline of their bodies. She also suggests blindfolding students while writing to determine which letters have been internalized. Only then are paper and pencil tasks introduced. "Roll and Write" was mentioned by one teacher. It is a commercial product which uses a marble to roll the pattern and show how a letter is made.

Responding to the question "**How do you use these methods and materials?**," one teacher said she used positive feedback by highlighting correctly formed letters with yellow marker. She suggested practicing writing skills for short periods of time, about 10 minutes, but on a regular basis.

Most regular education teachers provide the primary instruction for both printing and cursive according to this survey. Many special education teachers indicated they provide support and additional instruction depending on the individual student's needs.

The question of combining spelling and printing or cursive instruction was a controversial one. Many teachers elaborated as to why they agreed. Most of those who

agreed wrote that integration was very important, and it was an opportunity too good to pass up. Those who disagreed, referred to student "overload," or said the speller should not be penalized for poor writing skills. Several indicated that penmanship skills were a low priority compared to spelling.

Overwhelmingly, 2nd grade was named by 67% of the respondents as the year cursive instruction is introduced to not only the learning disabled but to regular education students. Sixty-seven percent of the teachers said "No," to the question of teaching cursive to students prior to printing skills. Twenty-seven percent said they had taught cursive to first graders depending on the needs and interests of the individual child. Some of those who responded "No" to the question did not want to make their LD students feel different. Others indicated that regular education teachers like LD students to follow the regular sequence.

While 41% indicated they taught some word processing to students, 52% did not. Of those who did teach word processing, some indicated they started teaching it to first graders. Many of the teachers who answered "No" wrote that they did not have a computer in the classrooms or did not have access to a computer.

Spelling

The procedure for reporting the results in Spelling is the same as in the section on Penmanship. It is divided as follows: Rank order of Methods and Materials, Definitions, and Discussion of Methods and Materials. The results are numbered in rank order followed by the percentage of total responses.

Rank Order of Methods and Materials

Methods

1. Language Experience 50%
2. Individual Spelling 50%
3. Other 43%
4. Peer Tutoring 40%

5. VAKT 33%
6. Rules of Syllabication 31%
7. Orton-Gillingham 27%
8. Fernald Tracing Method 19%
9. Project Language Arts 14%
10. Self-instruction 14%
11. Linguistic Rule Applications 12%

Materials

1. Workbooks 58%
2. Spelling Lists 52%
3. Computer Games 33%
4. Wooden or Plastic Letters 24%
5. Word Processor 20%
6. Typewriter 14%

Definitions

Orton-Gillingham, MTARSH, and **Traub** are part of a structured phonetic multisensory approach based on Orton's theory and research and described in Chapter Two.

The **Fernald Tracing Method**, while multisensory, is a whole-word and not structured phonetic approach. The method is intended to be used with a language experience approach as described in Chapter Two.

Distar Spelling is a spelling program based on SRA Distar I and II reading programs. Words used for spelling are taken from the reading context.

SRA Morphographic Spelling should have been listed as **SRA Corrective Spelling**. It is based on the use of morphographs in words. The SRA program is now known as Spelling Mastery.

Signs for Sounds Spelling is a two-part program I & 2. It is based on phonetic

words and **Linguistic Rule Applications** such as the "doubling rule."

Project Language Arts also known as **Project Read** is a reading, spelling, and writing program for grades 1-5. It emphasizes phonics and is a multisensory approach using handsignals. It stresses tapping for Red Words (non-phonetic words as "the," "was,"" four"). It is a comprehensive language program.

VAKT means visual, auditory, kinesthetic and tactile. This acronym is used to represent multi-sensory training to teach reading, and spelling words. Tracing in salt or sand, while spelling a word and looking at the model would be an example of VAKT. This would also include using plastic or wooden letter tiles for feeling the letters as well as typing the words on a keyboard.

Language experience often means writing down the student's own words or stories, and having the student read them back to the teacher. The teacher or student may decide which words to study for spelling. The idea is to get the child to express himself on paper.

Rules of syllabication means teaching the seven syllables, how to divide or combine them based on linguistic rules.

Word Processor refers computer programs in which the computer becomes a tool for typing, editing, and storing language which has been typed into it. Word processing programs have the ability to check spelling, move paragraphs and pages, number, underline, and other valuable tasks related to written expression.

Computer games and **Spell Master** refer to computer programs available for practice and instruction. These materials are referred to as Computer Assisted Instruction or CAI.

Peer Tutoring refers to students helping and teaching one another.

Strategies refer to self-instruction, generalization skills, systematic review, application of syllabication rules, or any problem-solving approach to learning and

remembering spelling words.

Individualized spelling means a spelling program based on the student's needs in which the student works at his/her own pace.

Discussion of Methods and Materials

A significant 50% of the respondents said they used Language Experience and Individualized Spelling. Many teachers expressed concern about meeting the student's individual needs and planned a student focused program. Several suggested that the Language Experience approach was the best way to individualize. Group and individual stories, journals and penpals are used in this method with students writing the spelling words in notebooks, card files or personal spelling dictionaries. These teachers incorporated writing with reading. Several teachers said they taught proofreading and editing skills with the language experience approach.

Several suggestions for individualized instruction included adapting the regular education spelling lists so that the learning disabled student might be able to function in regular education with his/her class.

A substantial 43% of those responding indicated Other ideas which included SRA Spelling Mastery. A consistent routine was also mentioned. Some suggested words that are meaningful and useful for the child. Several indicated they created their own spelling program especially for younger students. Teachers suggested creating lists of word families with the same phonetic patterns.

While 40% said they used Peer Tutoring, few explained how they used the method. Some indicated peer editing of written stories while others suggested using peers as study buddies for practicing words. Cooperative learning was also mentioned.

The Visual, Auditory, Kinesthetic, and Tactile (VAKT) method was named by 35% of the respondents. This method is a multisensory approach to teaching spelling. Others who did not indicate VAKT did name multisensory methods, however. This percentage may be

significantly higher if those were added.

Rules for Syllabication (31%), Orton-Gilllingham (27%), Project Language Arts (18%), and Linguistic Rule Applications (12%) can be grouped together because they are all derived from the basic approach of using phonetics to teach language skills from reading to writing. Many teachers who named workbooks chose a series with words divided into word families or patterns. Most combined this approach with multisensory salt or sand writng, air writing, letter tiles or plastic or wooden letters for students to build words. Several teachers said they used Recipe for Reading, but did not circle the "Traub Tutorial Program" on the survey. One teacher suggested that gross motor activities such as "Jumping Jacks " be combined with spelling.

Two teachers designed their own spelling program based on the Glass Analysis (a phonetic analysis test). The spelling program was built upon lists of word families. Prefixes and suffixes were systematically added to build on previous learning. The spelling program was designed to introduce five words per day and included activities such as word searches, configuration, unscrambling, and crossword puzzles. .

Syllabo was a game suggested by a few teachers. Although it is now out of print, the game is based upon the use of morphographs. The morphographs or word parts are learned as separate units but along with a specific group of real words that can be made from the parts. Students learn to combine the parts to make real words. It is a systematic and based on skill levels.

The Fernald Tracing Method was named by 19% of the respondents and was often used for troublesome words.

Teachers indicated that weekly Word Lists included the most frequently used words, months, days, seasonal words, words from the regular education classrooms, as well as from programs or books used in the special education setting.

Some interesting strategies that teachers mentioned included the following:

1. Several teachers said they used dictation of sentences with spelling lists, and said they studied spelling words within the context of sentences.
2. One teacher suggested using spelling contracts to motivate students.
3. A basic approach suggested by one teacher was to pre-test students' reading of the words before pre-testing for spelling.
4. Another suggestion was to color-code similarities or differences.
5. Cassette tapes for recording spelling lists for individual practice was also suggested.
6. A consistent approach was suggested by others. Some suggested a daily routine for each day of the week. Others suggested everyday practice of words on the computer. Computer programs suggested by teachers included Magic Slate, Spell Master, Magic Spells, Spelling Ace.
7. Some suggested tracing in sand or salt trays followed by table and sky writing.
8. Some programs included study sheets with check lists of steps to do for each spelling word.

Conclusion

Special Education teachers are using a variety of methods to meet the individual needs of students in both penmanship and spelling. In penmanship, most LD teachers are using D'Nealian and support the instruction given by regular education classroom teachers. Many provide additional practice through tracing and grouping letters by shape or families. Teachers use multi-sensory air and sand writing, as well as self-instruction techniques to enable students to internalize their writing. More than half combine penmnanship and spelling instruction.

Spelling instruction is primarily individualized and given through a language experience approach or teacher-preferred methods. However, a substantial number of teachers indicated they used phonetic and multisensory methods stressing phoneme-

grapheme relationships. Workbooks and Spelling Lists are the primary materials with additional practice on the computer.

CHAPTER FOUR

SUMMARY

This study began by reviewing the literature for a variety of methods and materials discussed in special education literature. The question of this study was "What methods and materials are Michigan special education teachers using to teach penmanship and spelling to the learning disabled?" A survey was designed with a checklist and short answer questions to elicit the maximum number of responses. Many teachers responded with lengthy and very interesting comments on the methods and materials they used. Some sent sample materials which they designed or discovered through experience as learning disabilities teachers.

The teacher-preferred methods for **Penmanship** included: **Tracing**, **D'Nealian manuscript and cursive**, **Air writing**, **and Writing in sand.** The teacher-preferred materials included: **Ditto sheets for writing**, **Finger-grip pencils**, **Changeable plastic grips**, **Color-coded paper**, and **Colored chalk.** The teacher preferred methods for **Spelling** included: **Language Experience** and **Individual spelling**, **Other** (a miscellaneous assortment), **Peer tutoring**, and **VAKT.** The teacher-preferred materials included: **Workbooks**, **Spelling lists**, and **Computer games**.

Teachers of the Learning Disabled in the state of Michigan appear to be using a variety of methods and materials to teach penmanship and spelling skills. Many teachers indicated they planned a program based on each student's individual needs. It is difficult to compare what theorists believe to be true and what research says works with the learning disabled to the classroom preferences of teachers in the field. Teachers do not necessarily follow the implications from research. Teachers use a personal belief system based on what they have experienced, and what they think works with learning disabled students. Some struggle trying to find the right method. There is no direct relationship between what research says and what teachers do.

While the focus was to examine the methods and materials teachers are using to teach the learning disabled, a review of the literature leads to comparisons. The remainder of this chapter will be devoted to that discussion.

The most controversial issue in penmanship in the last twenty years continues to be debated. Which method is better for all children, but in particular the learning disabled? Is it Circle and Stick or D'Nealian manuscript? In reviewing the research studies in penmanship and spelling it seems that there are few studies on penmanship. There is much rhetoric about which method should be used and why. Much is based on what experts believe to be true. The study by Oglesby was the only study which measured the quality of students' writing by comparing D'Nealian and Circle and Stick manuscript samples. Other studies compared the students' transition to cursive after receiving either Circle and Stick or D'Nealian manuscript instruction. Oglesby's study was conducted on students who had below average writing skills. No other studies comparing the performance of learning disabled students using either one of the methods could be found. While only one study could be found by this writer that would indicate in any way that D'Nealian is superior, results of the survey indicated that, based on experience and beliefs, LD teachers in the state of Michigan prefer D'Nealian for both printing and cursive.

Penmanship studies have been conducted using direct instruction, practice, grouping of letters in families, and self instruction techniques. Only one comprehensive study by McMillan specifically researched and tested the learning disabled. Other studies have been conducted on a limited number of students.

For students with dysgraphia who have difficulty remembering the shapes of letters or for those who have extreme difficulty with fine motor movements necessary to printing or cursive, remediation should include pre-writing skills as recommended by Hagin (1983) and Heyman (1977) because large motor movement skills precede fine motor skills. The teachers in this study indicated that multisensory sand and salt writing as well

as air writing facilitate this development.

Research indicates that self-instruction is a valuable strategy, and 28% of those surveyed agreed. While other practices such as tracing, color-coded paper, changeable grips for pencils, and colored chalk are used, the foundation for their use lies in what we believe to be true rather than in research. While tracing was included in the study by McMillan, it was included with other methods and the effects were not measured.

Teaching cursive to the learning disabled before printing has some merit based on the research of Traub (1982) and Grant (1985); however, early identification of these children has been a problem. Other studies focused on spelling without comparing printing and cursive.

The spelling methods that have been shown to work are those based on the research of Orton (1937), Gillingham and Stillman (1956), Traub (1982), and others which resulted in Recipe for Reading, and Multi-sensory Teaching Approach for Reading, Spelling, and Handwriting (MTARSH). Research has shown that the use of patterns has been helpful for teaching spelling to the learning disabled. Since the learning disabled have been shown to be developmentally delayed or deficient in processing, methods which use multisensory means to remediate the deficient auditory modality may be helpful for some children by promoting integration of the visual and auditory systems. Using Project Read, MTARSH, Traub or other Orton derivatives may be helpful to the learning disabled.

While Individualized Spelling and Language Experience seem logical, there is no research to support these methods with the Learning Disabled other than belief. In the Language Experience approach as suggested by Fernald (1943) and followed by current classroom practices of LD teachers, the student progresses at his own level. Teaching proofreading and editing skills, however, is essential. Uniting all of the language skills into a whole language approach does not fragment language skills into splinter skills. Many learning disabled students may be benefitting from this approach.

Peer tutoring, which was indicated by 40% of the teachers, has its foundation in regular education methods and practices.

Using the computer as a means of practicing spelling words has merit from research and from current practices. Students who are free from paper and pencil tasks may attend to the spelling task better on a computer. Using the computer to teach word processing and composition skills to the learning disabled, has little foundation in research and is limited in practice with the learning disabled. The reason may be that most teachers of the learning disabled don't have access to computers or don't have the technical training to teach word processing. Only 20% of those surveyed used the word processor to teach spelling to the learning disabled, while 41% responded that they taught word processing to compensate for handwritten work. Computer Assisted Instruction and word processing offer great promise to the special needs student, but more research is needed.

More research is needed in Penmanship and Spelling, especially studying the performance of learning disabled students. The learning disabled have been shown to be deficient in acquiring penmanship or spelling skills at the critical ages when most other children seem to acquire them. Since these deficiencies can be ameliorated through instruction, early identification is important. More research needs to be conducted to clearly identify the treatment methods to be used with pre-school children and children in early elementary grades. Teachers should consider both the results of research and their beliefs about methods and materials. They should test the benefits of their practices. Do these practices really work?

APPENDIX A

The D'Nealian Pencil Grip

By Donald N. Thurber

Over a century has passed since we stopped using the quill as a writing tool. Even though today's writing tools are vastly changed, people still hold their writing implements in the same manner. This antiquated way of holding a pencil has been known to produce blisters, writer's callouses and even distorted fingertip bone structure. For people with arthritis or other hand dysfunctions, this pressure-hold can cause unnecessary pain.

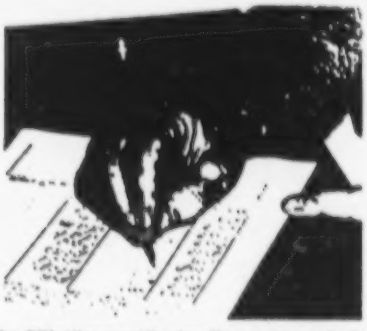
The "new" D'Nealian Handwriting grip provides an alternative way to grasp writing implements. It is not really new, since some people already hold their writing tools in this manner. However, it is new as a part of educational instruction.

With the D'Nealian grip, the pen or pencil is held between the index and middle fingers with the barrel resting on the web between the fingers. It is then grasped with the thumb, index and middle fingers about an inch from the point. The thumb gently holds the pencil in place against the other two fingers. The hand rests on the heel of the hand and slides on the tips and nails of the fourth and fifth fingers. The pencil is held with about a 25-degree slant from the vertical position. This provides a firm structure that doesn't require much fingertip pressure to hold the writing instrument. Remember, our hand, fingers and writing pressures vary, so that no two people will grip with the exact same position.

At present, there is a paucity of information in the whole area of handwriting, particularly regarding the grip. Now, because the D'Nealian grip is attracting increased attention, questions will need to be researched concerning proper gripping techniques. For this reason, I am keenly interested in gathering information from people already writing with the D'Nealian style hold. I would greatly appreciate information from them regarding: length of time using the hold; reason for using the hold; any drawbacks of the method; writing speed; approximate angle of pencil slant from zero-degree vertical; any personal hand dysfunctions; and their rating of their own legibility.

Readers should send correspondence to the author at the address below.

Donald N. Thurber
12674 North Lakeshore
LaSalle, MI 48145



The D'Nealian pencil grip offers a more relaxing and functional approach to writing.

The D'Nealian Pencil Grip. Used with permission of D.N. Thurber.

APPENDIX B

Table 7-2 Reading and spelling patterns of children with visual-processing weaknesses

- confusion with letters that differ in orientation (b–d, p–q)
- confusion with words that can be dynamically reversed (was–saw)
- very limited sight vocabulary; few words are instantly recognized from their whole configuration—they need to be sounded out laboriously, as though being seen for the first time
- losing the place because one doesn't instantly recognize what had already been read, as when switching gaze from the right side of one line to the left side of the next line
- omitting letters and words because they weren't visually noted
- masking the image of one letter, by moving the eye on too rapidly to the subsequent letter, may result in omission of the first letter
- difficulty learning irregular words that can't be sounded out (sight)
- difficulty with rapid retrieval of words due to visual retrieval weaknesses
- visual stimuli in reading prove so confusing that it is easier for the child to learn to read by first spelling the words orally and then putting them in print
- insertions, omissions, and substitutions, if the meaning of the passage is guiding reading
- strengths in left hemisphere language-processing, analytical and sequential abilities, and detail analysis; can laboriously sound out phonetically regular words even up to grade level
- difficulty recalling the shape of a letter when writing
- spells phonetically but not bizarrely (laf–laugh; bisnis–business)
- can spell difficult phonetic words but not simple irregular words

Table 7-2 taken from Smith (1983, p.230). Used with permission.

APPENDIX B

Table 7-3 Reading and spelling patterns of children with auditory-processing weaknesses

- difficulty discriminating between individual sounds in beginning reading instruction (occurs very seldom)
- difficulty processing rapid auditory inputs so that consonant sounds that cannot be sustained (p–b) are not perceived; these may then be omitted in reading
- poor ability to analyze the sequence of sounds and syllables in words; consequently they become reversed in reading words; this is akin to the problem faced orally when poor auditory analysis has taught the child such phrases as "lead a snot into temptation" and "Harold be thy name" in the Lord's Prayer, or "lmnop" being one lumped cluster in the alphabet song
- poor ability to remember individual sounds or sequences of sounds
- difficulty blending individual sounds into words
- difficulty listening to words and omitting one sound and substituting it for another (say "cat"; now take off the /c/ and put on a /f/); such abilities are essential to word analysis because that is what figuring out how to pronounce a word is all about; children usually develop this skill with initial consonants first, then final consonants, and then medial vowels or consonants
- difficulty remembering the sounds that individual letters and phonetically regular and irregular letter combinations represent
- unable to rapidly retrieve letter sounds while analyzing words so that the beginning of the word is forgotten by the time the last letter of the word is recalled (naming problem)
- difficulty analyzing unknown words due to poor knowledge of phonetic rules and analytic-sequencing problems
- word substitutions that are conceptually (person, human) or visually (horse, house), but not phonetically, related
- limited sight vocabulary because the student cannot memorize an abundance of words without the benefit of phonetic cues
- guessing at unfamiliar words rather than employing word-analysis skills
- spelling remains below reading level because it is attempted by sight rather than by ear
- correct spellings occur primarily on words that the child can revisualize
- bizarre spellings that seldom can be identified, even by the child, because they do not follow phonetic patterns
- extraneous letters and omitted syllables in spelling

Table 7-3 taken from Smith (1983, p. 231). Used with permission.

APPENDIX C

Michigan
Association of
Learning
Disabilities
Educators

504 Johnson
Middleville, Michigan 49333
August 7, 1989

Dear MALDE Member:

My name is Regina Stein. I am a MALDE member and a LD classroom teacher at Delton Kellogg Elementary. I am also a graduate student at Calvin College, Grand Rapids. I am in the process of writing my thesis for my Master of Arts in Teaching degree.

My research is on penmanship and spelling, and one of my goals is to survey Learning Disabilities teachers to find out what methods and materials are being used in the classrooms today.

The officers in MALDE have been supportive in my research by providing me with a random sample of members throughout the state. When my research is complete, I will write an article for the MALDE Bulletin so that I can share my results with you.

Each one of the surveys is numbered for analysis and follow-up but names and responses will remain confidential. The ideas you share will be included in the research report.

I am asking you to complete this survey today and mail it back to me by September 10, 1989. I would appreciate it before school starts if possible.

Thank you for your time in helping me by sharing your knowledge of what works with learning disabled students. I appreciate your efforts.

Sincerely,

Regina Stein and Bruce Irland
Publications
Chairperson

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APPENDIX C

No._____

The following methods and materials for teaching spelling to learning disabled students were compiled from journal articles. Please circle the method/s that you use. Then please elaborate on how you use these methods in teaching learning disabled students. Thank you.

1. Orton Gillingham
2. Orton-Gillingham-Stillman
3. Distar Spelling
4. SRA Morphographic Spelling
5. Signs for Sounds Spelling
6. Linguistic Rule Applications
7. Fernald Tracing Method
8. MTARSH-Mastery Learning Program
9. Add-a-Word Spelling Program
10. Speed Spelling Program
11. Traub Tutorial Program
12. Project Language Arts aka Project Read
13. Rules of Syllabication
14. VAKT
15. Language Experience
16. Word Processor
17. Computer Games (e.g., Sticky Bear Spelling)
18. Computer Spell Master
19. Peer Tutoring
20. Plastic, wooden, metal or cardboard letters
21. Typewriter
23. Strategies-Which ones?
24. Self-Instruction
25. Spelling lists
26. Spelling workbooks
27. Individualized spelling
28. (Other) _____

How do you use the method/s?

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Please describe any techniques or methods and materials that you have discovered or borrowed from other programs which have benefited your students.

_____

_____

How do you use these methods/materials?

_____

_____

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_____

The following are methods and materials for teaching penmanship or handwriting to students. Please circle the number of the method/s you use. Please elaborate on how you use them in teaching learning disabled students. Thank you.

1. D'Nealian (printing)
2. D'Nealian (cursive)
3. Manuscript Printing
4. Zaner-Bloser Handwriting
5. Cursive Alphabet Tracing Board
6. Magic Slates
7. Air Writing
8. Plastic templates
9. Salt Box, Salt Writing with Fingers
10. Sand Writing with Fingers
11. Tracing
12. Writing Ditto Sheets
13. Handwriting Workbooks: Which Series? _____
14. Finger Grip Pencils
15. Changeable Plastic Grips
16. Color-coded Paper
17. Self-Instruction While Writing
18. Colored Chalk
19. (Other)_____

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Please describe how you use any of these methods and/or techniques in teaching or remediating penmanship.

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Please describe any techniques or methods and materials that you have discovered or borrowed from other programs which have benefited your students.

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20. Is printing instruction given primarily by you as the LD teacher or by the regular education classroom teacher?

_____

21. Do you combine printing and spelling instruction?

YES NO

_____

_____

_____

22. In which grade is cursive introduced to your students?

_____

23. Is cursive instruction given primarily by you as the LD teacher or by the regular education classroom teacher?

_____

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24. Do you combine cursive and spelling instruction?

YES NO

25. Do you teach word processing for students who need to compensate for handwritten work ? YES NO

26. Have you taught cursive to LD students in lower elementary instead of printing?

YES NO

REFERENCES

Bailet, L. (1990). Spelling rule usage among students with learning disabilities and normally achieving students. Journal of Learning Disabilities, 23, 121-128.

Barbe, W.B., Milone, M. N. Jr., & Wasylyk, T.M. (1983). Manuscript is the "write start." Academic Therapy, 18, 397-405.

Barbe, W.B. & Johnson, W.R. (1984). A re-examination of the role of manuscript writing in Barbe, W.B. , Lucas, V.H., & Wasylyk, T.M. Handwriting: Basic Skills for Effective Communication. Columbus, OH: Zaner-Bloser, Inc. 105-110.

Behrmann, J. & Robinson, V., Eds., (1990). Technology in education, Counterpoint.

Boder, E. (1973). Developmental dyslexia: A diagnostic approach based on three typical reading-spelling patterns. Developmental Medicine and Child Neurology, 15, 663-687.

Brown, M. (1988). An investigation of spelling intervention with learning disabled elementary school students. B.C. Journal of Special Education, 12, 1-18.

Bryant, N. & Kass, C. Dirs. (1972). Final Report. Leadership Training Institute in Learning Disabilities.Vol. 1. University of Arizona: Dept. of Special Education.

Bryant, N. & Kass, C. Dirs. (1972). Final Report. Leadership Training Institute in Learning Disabilities. Vol., 2. University of Arizona: Dept. of Special Education.

Chisolm, J. (1987). The computer: teaching tool-learning tool? Academic Therapy, 23, 31-36.

Connell, D. (1983). Handwriting: taking a look at the alternatives. Academic Therapy, 18, 413, 420.

Dennison, P.E. & G.E. (1986). Brain Gym. Glendale, CA: Edu-Kinesthetics, Inc.

Early, G.H., Nelson, D.A., Kleber, D.J., Tregoob, M., Huffman, E., & Cass, C. (1976). "Cursive handwriting, reading, and spelling achievement." Academic Therapy, 12, 67-74.

Ehri, L.C. & Wilce, L.S. (1987). Does learning to spell help beginners learn to read words?

Reading Research Quarterly, XXII, 49-65.

Ehri, L. C. (1989). The development of spelling knowledge and its role in reading acquisition and reading disability. Journal of Learning Disabilities, 22, 356-364.

Farrell, D.(1988). Strategies for teaching handwriting to ld students. ERIC Document Reproduction Service No. ED299784.

Fernald, G. M. (1943). Remedial techniques in basic school subjects. New York: Mc Graw Hill.

Foster, K. & Torgesen J.K. (1983). The effects of directed study on the spelling performance of two sub groups of learning disabled. Learning Disability Quarterly, 6, 252-364.

Gerber, M. (1984a). Orthographic problem-solving ability of learning disabled and normally achieving students. Learning Disability Quarterly, 7, 157-163.

Gerber, M. (1984b). Techniques to teach generalizable spelling skills. Academic Therapy, 20, 49-57.

Gerber, M., & Hall, R. (1987). Information processing approaches to studying spelling deficiencies. Journal of Learning Disabilities, 20, 34-41.

Gerber, M., & Hall, R. (1989). Cognitive-behavioral training in spelling for learning handicapped students. Learning Disability Quarterly, 12, 159-168.

Getman, G.N.(1983). About handwriting. Academic Therapy, 4, 139-146.

Gettinger, M. (1984). Applying learning principles to remedial spelling instruction. Academic Therapy, 20, 41-47.

Gillingham, A., & Stillman, B. (1956). Remedial Training for Children with Specific Disability in Reading, Spelling and Penmanship. 5th ed. Cambridge, MA: Educators Publishing Service.

Giordano, G. (1983). Integrating remedial writing into reading programs. Academic Therapy, 18, 599-607.

Giordano, G. (1984). Analyzing and remediating writing disabilities. Journal of Learning

Disabilities, 17, 78-82.

Graham, S. (1983). Effective spelling instruction. The Elementary School Journal, 83, 560-567.

Graham, S. & Freeman, S. (1986). Strategy training and teacher-vs. student controlled study conditions; Effects on ld students' spelling performance. Learning Disability Quarterly, 9, 15-22.

Grant, Sr. M. (1985). The kinesthetic appraoch to teaching: building a foundation for learning. Journal of Learning Disabilities, 8, 455-467.

Hall, R.J. (1984). Orthographic problem-solving. Academic Therapy, 20, 67-75.

Hagin, R. A. (1983). Write right--or left: a practical approach to handwriting. Journal of Learning Disabilities, 16, 266-271.

Halpin, G & G. (1976). Special paper for beginning handwriting: An unjustified practice? The Journal of Educational Research, 69, 267-269.

Hanover, S. (1983). Handwriting comes naturally? Academic Therapy, 18, 407-412.

Heyman, E. (1977). Cursive writing begins with chalk. Teaching Exceptional Children, 21, 106-109.

Hynd, G.W. , Obrzut, J.E., & Bowen S.M. (1987). Neuropsychological basis of attention and memory in learning disabilities in Swanson, H. L., Advances in Learning Behavioral Disabilities, Supplement 2, Memory and Learning Disabilities. Greenwich, CT: JAI Press, 175-201.

Jacobi, C. (1986). Word processing for special needs students: Is there really a gain? Educational-Technology, 26, 36-39;

Jimenez, J. & Rumeau, M. (1989). Writing disorders and their relationship to reading-writing methods: A longitudinal study. Journal of Learning Disabilities, 22, 195-199.

Johnson, D. J. & Myklebust, H. R. (1967). Learning Disabilities Educational Principles and Practices. New York: Grune & Stratton

Johnson, D. & Blalock, J. (1987). Young Adults with Learning Disabilities. New York: Grune and Stratton.

Kass, C.E. (1986). Learning Disabilities in the Christian School: Design for Action. Grand Rapids, MI: Calvin College.

Kerchner, L.B. & Kistinger, B.J. (1984). Language processing/word processing: Written expression, computers and learning disabled students. Learning Disability Quarterly, 7, 329-335.

Kosiewicz, M., Hallahan, D.P., Lloyd, J., & Graves, A. (1982). Effects of self-instruction and self-correction procedures on handwriting performance. Learning Disability Quarterly, 5, 71-77.

Lieberman, I.Y., Shankweiler, D. (1987). Phonology and the problems of learning to write, in Swanson, H.L., Advances in Learning and Behavioral Disabilities, Supplement 2, Memory and Learning Disabilities, 203-224.

Luria, A. R. (1966). Higher Cortical Functions in Man. New York: Basic Books, Inc.

Luria, A. R. (1973). The Working Brain. New York: Basic Books, Inc.

MacArthur, C.A. & Graham, S. (1987). Learning disabled students' composing under three methods of text production: Handwriting, word processing, and dictation. Journal of Special Education, 21, 22-42.

Mc Millan, I. (1985). A cursive handwriting skills program for LD students to be used by regular and LD teacher. Ed. Practicum. Nova University. 1-48.

Mann, V.A. (1986). Why some children encounter reading problems: The contribution of difficulties with language processing and phonological sophistication to early reading disability in Torgesen, J.K. & Wong, B.Y. Psychological and Educational Perspectives on Learning Disabilities. Orlando, FL: Academic Press, 133-159.

Michigan Board of Education (1986). Revised Administrative Rules for Special Education and Rules for School Social Worker and School Psychological Services. Lansing, MI:

Author.

Milone, M.N., Wasylyk, T.M., & Pappas, R. (1980). Manuscript to cursive: A comparison of two transition times. (#6101) Columbus, OH.: Zaner-Bloser.

Myklebust, H.R. (1960). The Psychology of Deafness: Sensory Deprivation, Learning, and Adjustment. New York: Grune and Stratton.

Nulman, J. & Gerber, M. (1984). Improving spelling performance by imitating a child's errors. Journal of Learning Disabilities, 17, 328-332.

Oglesby, B. C. (1982). A comparative study of the difference in the manuscript handwriting performance of six below average second grade students who experienced the d'nealian method of handwriting instruction for a nine week period when compared to six below average second grade students who experienced the zaner-bloser method pf handwriting instruction for a nine week period, as measured by four judges' scores on a teacher-made check-list. Master's Thesis. University of North Florida, Jacksonville.

Orton, S. T. (1937). Reading, writing, and speech problems in children. New York: W.W. Norton, Inc.

Ourada, E.N. (1985). Legibility of third grade handwriting: D'Nealian versus traditional zaner-bloser. Master's Thesis. Foster G. McGaw Graduate School of National College of Education.

Phelps, J. & Stempel, L. (1987). Handwriting: evolution and evaluation. Annals of Dyslexia, 37, 228-239.

Polsgrove, L. & Rieth, H.J. (1984). Using microcomputers with LBD children, in Blackhurst, E., Using Microcomputers with Handicapped Children. Boston: Little Brown.

Poteet, J. (1980). Informal assessment of written expression. Learning Disability Quarterly, 3, 88-98.

Read, C. (1971). Pre-school children's knowledge of english phonology. Harvard Educational Review, 41, 1-34.

Reith, H.J., Polsgrove, L., &Eckert, R. (1984). A computer-based spelling program. Academic Therapy, 20, 59-65.

Scott, Foresman (1987a). D'Nealian Handwriting: Teachers Ediction, Book 2. Glenville, IL: Author.

Scott, Foresman (1987b). A history of handwriting in america. Glenville, IL:Author.

Smith, C. R. (1983). Learning Disabilities. The Interaction. of Learner, Task and Setting. Boston: Little Brown.

Storch, I. (1987). Helping learning disabled students improve their handwriting skills. 1-10. ERIC Document Reproduction Service No. ED299758.

Swartz, S. (1983). Spelling disability: A developmental linguistic analysis of pattern abstraction. Applied Psycholinguistics, 4, 303-316.

Thurber, D.N. (1983). Write on! with continuous stroke point. Academic Therapy, 18, 389-395.

Thurber, D.N. (1984). D'Nealian Manuscript: A Continuous Stroke Approach to Handwriting. Novato, CA: Academic Therapy Publications.

Thurber, D.N. (1990). Interviews May & June, 1990.

Torgesen, J.K. (1986). Computer assisted instruction with the learning disabled in Torgesen, J.K. & Wong, B.Y., Psychological and Educational Perspectives on Learning Disabilities. Orlando, FL: Academic Press, 417-435.

Trap-Porter, J., Cooper, J.O., Hill, D.S., Swisher, K., & LaNunziata, L.J., (1984). D'nealian and zaner-bloser-manuscript alphabets and initial transition to cursive handwriting. The Journal of Educational Research, 77, 343-345.

Traub, N. (1982). Reading, spelling, handwriting: Traub systematic holistic method. Annals of Dyslexia, 32, 135-145.

Vickery, K.S., Reynolds, V. A., & Cochran, S. W. (1987). Multisensory teaching approach for reading, spelling, and handwriting. Annals of Dyslexia, 37, 189-200.

Weisberg, P.G. (1985). Teaching spelling to the learning disabled using traditional and remedial approaches; A workshop. Paper presented to the international conference ACALD, 1-22. ERIC Document Reproduction Service No. ED256118.

Williams, J.P., (1986).The role of phonemic analysis in reading in Torgesen,J.K. & Wong, B.Y., Psychological and Educational Perspectives on Learning Disabilities. Orlando, FL: Academic Press.

World Book Dictionary (1989). Chicago: Worldbook, Inc.

Zaner-Bloser (1989). Zaner-Bloser Handwriting: Basic Skills and Application, K-8. Columbus, OH: Author.

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